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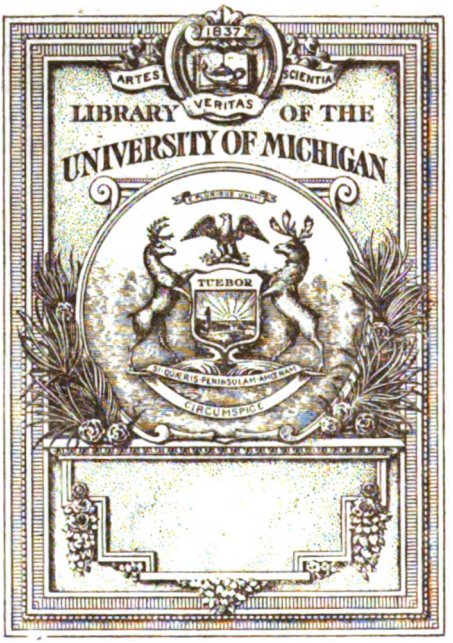

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FIFTH

ANNUAL REPORT

OF THE

STATE BOARD OF HEALTH

OF

WISCONSIN.

1880.

MADISON, WIS.:
DAVID ATWOOD, STATE PRINTER.
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MEMBERS.

E. L. GRIFFIN, M. D., *President*, Fond du Lac.

J. T. REEVE, M. D., *Secretary*, Appleton.

JOHN FAVIL, M. D., Madison.

SOLON MARKS, M. D., Milwaukee.

GEN. JAMES BINTLIFF, Darlington.

H. P. STRONG, M. D., Beloit.

G. F. WITTER, M. D., Grand Rapids.

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GENERAL REPORT OF THE BOARD.

OFFICE OF THE STATE BOARD OF HEALTH OF WISCONSIN,
October 31, 1880.

To his Excellency, W. E. SMITH,
Governor of Wisconsin:

SIR—In accordance with the provisions of law under which this board is organized, we have the honor to present the following fifth annual report.

In the accompanying report of the secretary, to which you are respectfully referred, will be found a detailed statement of the general work of the board, and of the means by which it is executing the important trust committed to its charge. That report will show that the work of the board has reached a larger proportion of the state than during any previous year of its history, and we trust that as its labors have been extended its usefulness has likewise been increased.

THE GENERAL HEALTH OF THE STATE

has been on the whole better than during the preceding years of the board's existence, though we still have to mourn the sacrifice of many valuable lives, and to witness a great amount of suffering which might have been avoided had the knowledge of sanitary science been more widely diffused among and heeded by the people. Among the chief causes of mortality in the state during the year covered by this report,

DIPHTHERIA AND SCARLET FEVER

have stood pre-eminent, the former being charged by the returns of the health authorities of the several towns of the state with having caused 1,780 deaths, and the latter as being the cause of

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390; the aggregate of these numbers being more than four times that of the deaths due to small-pox, typhoid fever, measles and whooping cough collectively.

It is to be hoped that in the progress of medical and sanitary science some means will be found by which these diseases shall be robbed of their present terrors, and brought under control as certainly as has that scourge of former days, small-pox, which, though it still lingers among us, and breaks out into occasional epidemics where vigilance in regard to its prevention relaxes under a fancied security, no longer counts its victims by thousands annually. Small-pox is indeed a disease which sanitarians believe to be capable of being perfectly controlled; yet in the early part of the last century it alone caused the death of one-tenth of the whole population of central Europe, and the life-long disfigurement of one-tenth more. We have not yet the knowledge which will enable us as efficiently to control the the ravages of diphtheria and scarlet fever, and, until such knowledge has been obtained, we must fight these destroyers with the best weapons at our command; no insignificant portion of the work of this board has been to endeavor to spread broadcast among our citizens a knowledge of the most efficient of these weapons, and the methods of using them to the best advantage. That there is much encouragement for persistent effort in this direction is proven by letters which frequently reach the office of the board, testifying to the benefits already received by many localities.

OTHER DISEASES.

Typhoid fever has prevailed to a somewhat greater extent, and its type has been more serious than during the year 1879, while measles and whooping cough have been much less frequent.

Small-pox has caused only two deaths during the year; although the disease has been brought into the state from without on three several occasions, its spread in each case has been controlled and confined to the families in which it first made its appearance, by strict isolation of the patients and quarantine of the infected premises. And just here a word of warning seems eminently in place. While we are comparatively free from the attacks of this

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dreaded and loathsome disease, we are too apt to neglect the employment of the only precaution which has ever proven effective as a safeguard against its ravages, *i. e.*, vaccination. Parents, thinking that there is no immediate danger, put off the performance of the operation upon their children, and others who have been vaccinated in early life forget that the protection then acquired may wear out with advancing years, and neglect to assure themselves of its continued efficiency by the only means by which this can be tested, *i. e.*, revaccination; and thus a large number of unprotected individuals accumulates in the midst of a community, constituting an ever-present source of danger. By-and-bye a case of small-pox comes into the vicinity through some one of the accidental chances spoken of in the secretary's report, or it may be through some channel which cannot be traced out, and one after another those who are susceptible are seized upon, until the malady assumes the proportions of a full-fledged epidemic; every one takes fright, business comes to a standstill, and all the interests of the place receive a check from which recovery is always very slow, if it takes place at all. Then every one becomes anxious for vaccination, which is performed on a large scale, in some cases perhaps not with the thoroughness requisite for its full efficiency; and at last the disease subsides or dies out for want of further material, after which the people begin to count up the cost in money and life.

Now all this — and scores of places can testify that we have drawn no fancy sketch — can well and easily be avoided by the simple method of making vaccination compulsory. We are well aware that there are many among our citizens, especially among those of European birth, who are by no means ready to accept this conclusion, and it may also be the case that the community as a whole is not yet prepared for direct legislation for this purpose. But our school boards all over the state should see that no child is admitted to any public school without good and sufficient evidence that vaccination has been properly performed; the proprietors of large manufacturing establishments of all kinds should keep a proper oversight of their employes in this regard, and, the subject being in this and other ways kept before the people, the way may and probably will be finally opened for efficient action.

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General Report of the Board.

ILLUMINATING OILS.

As was stated in our last annual report, our attention having been attracted by the frequency with which so-called kerosene "accidents," resulting in serious personal injury or loss of life, were reported in the columns of our newspapers, the cause of such accidents was made a subject of special study and investigation by the board. In the course of this inquiry a large amount of evidence was collected concerning the character of the illuminating oils then in general use throughout the state, and it was ascertained that, while stringent laws regulating the sale and use of such oils were enforced in the states adjoining our own, Wisconsin was practically without any law on the subject, and was, as a consequence, the recipient and consumer of oils rejected elsewhere as unfit for use because dangerous to property and life.

It was further ascertained that kerosene accidents were much more frequent in their occurrence in this state than in those states which were protected by statutes regulating the sale of petroleum oils. Under such circumstances the board felt it to be a duty to urge, in the interests of the property and lives of our citizens, that protection should be given to the people by proper legislation on the subject, and was gratified by the enactment of a statute which, thought not in all respects such as met its fullest approval, was, nevertheless, one which it was felt would secure a reasonable degree of safety in the use of one of the commonest necessities of daily life in nearly every household in the state.

It affords the board much pleasure to call attention to the noteworthy change, in the almost complete disappearance of the accounts of kerosene accidents which were of such frequent and painful occurrence in the columns of the Wisconsin press prior to the enactment of this law. A record like this is the strongest possible justification of the action of the board.

As has heretofore been the custom, copious and interesting extracts from the correspondence of the board throughout the state are appended to the report of the secretary. These, in many instances, show the progress already made in sanitary work in various localities, while in yet other cases they bring to light various local

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causes of disease, or point the way for new effort for its prevention.

Some special papers on sanitary subjects will also be found, which have been mostly prepared by gentlemen who, though not connected with the board, have special fitness for the discussion of the subjects presented. The board takes this opportunity to return sincere thanks to the gentlemen in question for the kindness which has enriched the report with information that cannot fail to be of special value to the people on whose behalf they have labored.

Among the papers prepared for and presented with this report is one by Dr. H. P. Strong, a member of the board, on

GENERAL HYGIENIC KNOWLEDGE A NECESSITY FOR THE PEOPLE,

in which the writer traces the slow progress of hygienic knowledge, and after giving a general definition of hygiene, it is shown how largely the necessity for this knowledge enters into our physical, moral and intellectual well-being. The necessity for organized and united action is shown, inasmuch as an uncontrolled individual may neutralize the best efforts of his neighbors, and so a whole community be caused to suffer for the fault of one. Only state or national control can affect the greatest good of the greatest number.

The relation hygiene occupies to the several epochs of life are briefly given, and advancement is proven by the history and statistics of the past as contrasted with the present partial immunity from the scourges of olden times. Attention is called to the fact that while our necessities equal those of other nations, yet some, notably England, is far in advance of us in the machinery necessary to a fair education of the public mind, and that we are lamentably behind that nation both in governmental supervision and authority over sanitary questions, and in the general knowledge of the subject possessed by the people.

The subject is briefly treated from a commercial or financial standpoint, from which we find that proper hygienic knowledge is as necessary to the body politic as it is from a consideration of the humanitarian aspect, and then follows a series of propositions call-

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ing attention to the necessity for more general information, and indicating more in detail some of the things which it is necessary to know.

The paper closes with the suggestion that hygiene should be included in the curriculum of our system of common school education, even though it exclude some studies of less practical importance.

Another paper is upon

RECREATION AS A SANITARY AGENT,

by Rev. J. W. Hageman, of Wausau. The writer takes the ground that recreation is a necessity to a healthy life, and points out the various methods in which it may be had; he recognizes the fact that what is labor for one may be the best of amusement for another, and advises that, in taking recreation, as complete a change as is practicable from the customary pursuits of the individual should be secured; that some active outdoor life be entered upon by the sedentary, while some quiet indoor occupation, or even absolute and entire rest of body and mind, should be the aim of those whose usual vocations require great exertion. Various methods of obtaining recreation are sketched or suggested, and the mistake sometimes made of supposing, that because a mode of life varies from the ordinary routine, it must necessarily be recreating, is pointed out. True recreation can never be a bore, in the writer's opinion; and whenever any occupation or excursion entered upon for amusement's sake becomes dull and tiresome, it will fail of being recreative in any right sense, and may better be abandoned so far as that object is concerned. The paper closes with an appeal for recreation for all in the interest of the higher life.

Another paper has been prepared by Dr. H. P. Wenzel, of Lomira, upon

DISEASED MEAT.

The various forms of disease which affect animals raised for human food are sketched, especially those which affect the character of their flesh, and the danger of using meat from animals so affected is pointed out. The parasites which inhabit the muscular and other tissues of animals are next treated of, particular attention being

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given to such as are known to give rise to disease in the human being; under this head trichiniasis and tape-worm in man are discussed, and the means by which the parasitic creatures producing them may be rendered harmless where their presence is suspected, are pointed out. The question of legislation is then discussed, and references are given to such of the statutes of Wisconsin as bear upon the subject generally.

Prof. T. W. Chittenden, of Appleton, contributes a paper upon

SCHOOL HYGIENE,

and what teachers can do to promote it. The subjects of Ventilation, Light, Seating, Exercise, Oversight of the Playground, Defects of Sight and Hearing, the merits of dry and moist atmospheres, the effects of position, the prevention of contagious disease in schools, and the signs of sickness generally, or those which will justify a teacher in remanding a child for the time being to home care, are all more or less fully discussed, and the writer has aimed to give the conclusions reached by the best and most modern authorities.

This whole subject of the health of the children in our public schools is one that is engaging the earnest attention of sanitarians both in our own country and Europe, at the present time, to a very remarkable extent. Never before has the fact been so clearly realized that the welfare of the world in the near future depends upon the care and pains bestowed upon the education, both physical and mental, of the rising generation. No apology, therefore, seems needed for the prominence given to the subject of schools and their sanitary condition in this and in preceding reports.

In addition to the plans by which the ventilation of existing school houses may be improved, as presented in Prof. C.'s paper, the following, by Dr. Swinburne, of Albany, N. Y., is worthy of adoption, particularly in mild weather: "A very effectual way to secure good ventilation, is to use one-half or even two-thirds of the window space by inserting light frames covered with thin muslin without starch. The changes of air go on as they do in a tent, and the air is rendered as pure as that out of doors. Whenever in the charity hospital we have typhoid or scarlet fever, we simply fill the

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window spaces with frames over which thin muslin is stretched, and the purity of the air is surprising."

We are yet very far from perfection in the construction of our school houses or in their furniture. "It cannot be denied," says Dr. Jewett, "that under the present provisions and restraint of the school room, the foundations are laid of many maladies that entail suffering and misery during a longer or shorter period of life. The extent and fatality of preventible diseases, and the inception of germs of future wretchedness and deformity as the result of our present school system, is appalling, and demands a thorough scrutiny and reformation. In cemeteries all over this land are little graves whose inmates have been put there by the ignorance or carelessness of school teachers or trustees."

Hon. John Eaton, commissioner of public education, Washington, D. C., uses the following emphatic language: "It must be confessed that there are school officers who hold their places in comparative ignorance of the principles of education. They have allowed schools to receive and communicate diphtheria, scarlet fever and small-pox. They have permitted unhealthy conditions to multiply around schools, until from them has gone out sickness to desolate neighborhoods. They should be held responsible for all the unnecessary myopia, curved spines and infection due to their ignorance or neglect. A great step might be taken immediately by giving sanitation its proper position in our normal schools, and by giving sanitary subjects proper consideration in teachers' associations and institutes."

By the kindness of Dr. O. W. Wight, health commissioner of the city of Milwaukee, and with the consent of the executive committee of the American Public Health Association, for which organization it was written, we are enabled to present a paper on the

MANAGEMENT OF CONTAGIOUS DISEASE IN MILWAUKEE.

This paper exhibits clearly and forcibly the results which may be attained by sanitary science when upheld by public sentiment, and its teachings are enforced by law. With some modifications, varying with the necessities of different localities, the system presented by Dr. Wight might be adopted by every municipal organization in

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the state, with the best possible results; and were the principles inculcated by him faithfully carried out in all our villages, towns and cities, a single year would show a marked diminution in the number of victims of contagious disease, and greatly lessened mortality returns from other causes.

A paper on

KEROSENE

has been prepared by the secretary at the special request of the board, with the design of bringing before the people facts in relation to this substance which it is believed will be of general interest. Kerosene is now so extensively employed as a household illuminant, and so many fearful accidents have resulted either from its careless use or from that of an inferior or adulterated article — most often from the two latter causes — that the board feels that information upon this subject should be spread among all classes of our citizens as widely as possible.

In conclusion, the board desires to acknowledge the aid which it has received from the medical profession of the state, who have generally responded promptly to any requests for information concerning the sanitary condition of their respective localities; and from the Wisconsin press, which has given a wide publicity to various circulars and similar publications of the board, and has shown a general interest in its work and a desire to aid its efforts to spread sanitary knowledge among the people.

Appended hereto will be found a communication in the shape of a personal letter to a member of the board, from Prof. George W. Peckham, of the Milwaukee high school, written in reply to certain questions presented to him concerning the study of physiology and hygiene in schools, to which the board desire to give this prominence because of the importance of the subject to which it relates.

Very respectfully,

E. L. GRIFFIN,
JOHN FAVILL,
JAMES BINTLIFF,
G. F. WITTER,
J. T. REEVE,
SOLON MARKS,
H. P. STRONG,
State Board of Health.

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General Report of the Board.

MILWAUKEE, October 10, 1880.

MY DEAR DOCTOR — In reply to your request that I should inform you how far the university and the public schools of the state are doing their share in spreading a knowledge of physiology and hygiene, I regret to say little, if anything. The great majority of our higher schools, both private and public, teach so little physiology that there is no sound foundation upon which to give instruction in sanitary science. Let me explain more in detail. The greater number of our higher schools shape their courses of study to meet the requirements of the state university, and, speaking generally, what it requires for admission, they teach. If we enlarge our course, as a general rule those students preparing for the university omit the studies not demanded for admission. The university offers three general courses of study: the general science, the ancient classical and the modern classical. For the first, the science course, it has an entrance examination in Huxley's and Youman's physiology. The time devoted in the schools to preparing in this subject averages one term of four months, a period totally inadequate to obtaining a fair knowledge of this science. For entrance to the classical courses, either ancient or modern, no knowledge in physiology is required. Why students in the scientific course need physiology, while those in the classical courses do not, I am at loss to understand. You will, I presume, suppose that the university itself supplies this lack, but here you are in error. While it offers options in Greek, Latin, German, French, Norse, Icelandic and Anglo-Saxon, there is absolutely no opportunity given a student to acquire even the rudiments of the laws of health; and so far as the university is concerned, a student can graduate from either of the classical courses ignorant both of physiology and sanitary science. As a matter of fact, the tendency of this course on the part of the university is to discourage the study of these two studies, if it does not lead to their entire neglect, by at least one-half of the students (the classical) who attend the university. As a result of this policy, one school in the state has within three months cut down the instruction in physiology from seven (7) months to barely three (3). This would exclude any work in sanitary science and renders the physiological instruction almost without value. Under the laws of this state a graduate of our university may obtain, without examination, a life certificate which qualifies him to teach in any school in the state. Hence it results that the management of large numbers of children may be entrusted to persons ignorant of the simplest laws of health. My experience of the past three years as one of the examiners on the state board of examination, and my general acquaintance with the instruction in this science throughout the state, forces upon me the belief that no subject is so sadly neglected as physiology. This dense ignorance must of necessity exert a prejudicial influence on the well-being of the citizens of the state, and as surely cripple the efforts of both the state and the local boards of health in the direction of sanitary reform. From the practical side, if only for the information that it gives, I think that you will agree with me that it is second in importance *to no other study*.

I remain yours truly,

GEORGE W. PECKHAM

TO SOLON MARKS, M. D.,
Member State Board of Health,
Milwaukee, Wisconsin.

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Secretary's Report.

SECRETARY'S REPORT.

To the Board of Health and Vital Statistics of the State of Wisconsin:

GENTLEMEN — The following, my fifth annual report as secretary and executive officer of the State Board of Health, is respectfully presented, it being for the year ending October 31, 1880.

During the year there has been no change either in the constitution of the board or in its officers, the vacancy occasioned by the expiration of Gen. J. Bintliff's term of membership having been filled by his reappointment, while at the annual meeting of the board in January last, Dr. E. L. Griffin was re-elected to the presidency, the secretary being continued in office.

The names and addresses of the several members, with the dates at which their respective terms of membership expire, are as follows:

S. Marks, M. D., Milwaukee, -	term expires February 2, 1881
J. Favill, M. D., Madison, - -	term expires February 2, 1882
E. L. Griffin, M. D., Fond du Lac,	term expires February 2, 1883
G. F. Witter, M. D., Grand Rapids,	term expires February 2, 1884
H. P. Strong, M. D., Beloit, - -	term expires February 2, 1885
J. T. Reeve, M. D., Appleton, -	term expires February 2, 1886
Gen. J. Bintliff, Darlington, - -	term expires February 2, 1887

The following standing committees were appointed at the meeting in January, 1880, for the coming year:

On Finance — Drs. Favill, Marks and Witter.

On Legislation — Gen. Bintliff, Drs. Strong and Witter.

On Printing and Stationery — Drs. Reeve, Favill and Griffin.

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On Visitation and Sanitary Inspection of Public Buildings — Gen. Bintliff, Drs. Marks and Reeve. The chairman was authorized to call upon any other members of the board for assistance, whenever it should seem advisable or necessary for the better performance of the work assigned to this committee.

At the same meeting, a committee which had been previously appointed to consider the subject of illuminating oils, with the dangers arising from the domestic use of low grades thereof, and the best means of avoiding or preventing such danger, presented a report, in which it was shown that a very large part of the oil then in use throughout the state of Wisconsin was exceedingly dangerous in character, and that much valuable property and many lives were annually and needlessly lost by its agency, and that the details of many such losses — originating, not in any careless use of the oil, but in actual explosions of lamps in which it had been burning — were in the possession of the committee. It was shown, moreover, that there was not only great danger in using such oils as were then almost universally for sale in the markets of the state, but that there was very general and very just complaint of their illuminating qualities, they being in many instances so heavily loaded with paraffine and other adulterants as to solidify with a very moderate degree of cold in the winter, so that it became necessary to warm the vessels containing it before lamps could be filled; that the lights would smoke and finally go out; and that the people were suffering a grievous evil from the sale and use of such oils, the existing laws of the state affording them no protection whatever.

In view of these facts and in accordance with the instructions of the board, the committee presented the draft of a bill, the passage of which by the legislature would, it was believed, secure an oil so free from impurities as to be a good and satisfactory illuminant, without being oppressively increased in cost, and which would insure a high degree of safety in practical use, if it could not be said to be absolutely safe under any and all circumstances.

The bill provided for the appointment, by the governor, of a suitable person, who should not be in any way interested in the manufacture or sale of illuminating oils, as inspector of all oils

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offered for sale or use for illuminating purposes, and for the appointment by the state inspector of a sufficient number of deputies who should act under his instructions and supervision.

That the state inspector and his deputies should examine and test all oils offered for sale or use, branding all that came up to the requirements of the law as approved, and all others as rejected, for illuminating purposes within the state, and that all inspectors should give proper bonds for the faithful discharge of their official duties.

That the tests which an oil must bear in order to be approved, should be the following: 1. It must not give off an inflammable gas or vapor when heated in a covered vessel at any temperature below 140° Fahrenheit. 2. When cooled to the temperature of 20° Fahrenheit, it must remain perfectly clear and transparent during the period of ten minutes of time. 3. That the instrument used in making the first portion of the test should be essentially the same as that for several years employed for the same purpose in the state of Michigan.

Concerning the test prescribed above, it may be said here that the board believed that it was its special province to emphasize the question of safety in use, and that an oil having a flashing point not lower than 140° Fahrenheit would be almost absolutely safe under any conditions likely to be found in an ordinary household. It was conceded, however, that an oil of this grade would be necessarily somewhat expensive in its first cost, and that oil having a flash-test of 120° Fahrenheit would be practically safe, with the exercise of ordinary care and prudence in its use — certainly far safer than the larger part of the oil to be found everywhere in Wisconsin at that time, while its increased cost would be balanced to a great extent by its superior lasting qualities; and that therefore an oil of this grade might be adopted with the certainty that its price would not prove in any way oppressive.

The bill further prescribed a scale of fees for inspection, provided penalties for its violation, and ended with a section allowing sixty days to intervene between its passage and the time when it should take effect.

The report was accepted by the board and the committee dis-

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charged, after which the bill above outlined being carefully reviewed and some minor amendments made therein, it was fully approved by the board, and it was decided to make an effort to secure the passage of it, or of some measure of like character, through the legislature, to the end that our citizens might enjoy the same security as to life and property enjoyed by those of states in which proper inspection laws were then in force.

Pending the discussion of the subject, it was ascertained that Hon. J. B. Bennett, of the twenty-third senatorial district, had introduced a bill into the senate also looking to the inspection of illuminating oils. Examination showed that Senator Bennett's bill differed in many particulars from that prepared by this board, and accordingly through the courtesy of that gentleman a conference on the subject was arranged, at which were present not only Senator Bennett, the committee to whom his bill had been referred and the board, but many other gentlemen, members of both branches of the legislature, by and before whom the bill already in the hands of the committee and that prepared by the board were compared and reviewed. At the same time a large amount of evidence was presented of the danger attendant upon the employment of oil such as was then very generally used in the state. Many different instruments for testing oils, including the Tagliabue open cup, commonly known as the "commercial tester," Foster's automatic tester, the English, the Indiana and the Michigan testers, were exhibited, their methods of action shown and their merits and defects fully explained. Soon after this interview the bill prepared by this board was also introduced into the senate by Mr. Bennett. The board subsequently presented an elaborate memorial to the legislature, setting forth the facts concerning the character of the oil then to be had in our markets, and earnestly pleading for such legislation upon the subject as should entirely prohibit the sale and use of illuminating oils of dangerously low grade, representing the urgent necessity of such measures in the interest and for the protection of the lives and property of our citizens.

A law was finally enacted differing in several respects from that recommended by this board, yet embodying the features of the bill recommended by it which were deemed most essential.

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Secretary's Report.

Concerning the practical operation of this law, it may be said that whereas, prior to its taking effect, accounts of accidents more or less serious in their results, originating in kerosene explosions, were of startlingly frequent occurrence in the columns of our newspapers, such records have entirely ceased since the date at which the present statute went into operation.

COST OF COLLECTING VITAL STATISTICS.

In accordance with instructions previously given, the secretary reported that he had inquired into the cost of collecting such vital statistics as under existing laws it is possible to obtain in this state, and that such cost for the year 1879 had been as nearly as could be ascertained, $10,926.70. The report was accepted by the board, which reiterated its conviction that the statistics thus obtained were worthless for any sanitary or scientific purposes, and that statistics having value for such purposes cannot be obtained under present statutes; it was not deemed advisable, however, at present to suggest any legislation for the purpose.

REPORTS FROM LOCAL HEALTH BOARDS.

I have again to report the encouraging fact of an increase in the number of reports made by the clerks of the local health boards throughout the state, and to make note also of the fact that with each year the importance of these returns is becoming more fully appreciated by those officers. While the records of this office for the first years of its existence show that the duty of making reports was, in some sections of the state, almost wholly neglected, and in some others performed only in the most perfunctory manner, they also bear witness to the fact of an increase that has been steady and gratifying in the care taken in the collection of facts, in the interest shown in the work of this board, and in the notes concerning matters of sanitary value and importance, that are not specifically mentioned in the blanks furnished for the purpose of making returns. In addition to the formal returns required by the statute, voluntary communications are often received, both in connection therewith and at other times, extracts from some of which were pre-

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sented in the fourth report of the board, and others still form a portion of the present volume. Such extracts and communications indeed bid fair to become an interesting and important feature of our annual publications. Recognizing the difficulties in the way of securing full and accurate data on which to base their reports, we must give these gentlemen credit for the very great pains which the majority of them must have taken to obtain such data, and for the labors which have produced so good results.

There are still some — comparatively few, however — who do not understand that, in default of any more formal organization, the ordinary authorities of any town, village or city constitute the board of health for that locality, and that the duty of making the returns required by this board devolves by law upon the town, village or city clerk. The number of those officials who fail to comprehend this fact happily grows smaller with each successive year, and we now look hopefully for a time when every municipal organization in Wisconsin shall be represented upon our records.

To all clerks of local health boards in Wisconsin circulars have been sent as usual, together with blank forms on which to make proper returns; these blanks are furnished in duplicate, to the end that a copy of each report may be kept on file in the office from which it is sent, and the labor of collecting information in successive years greatly abridged. Copies of the circular and of the blank form on which the returns have been made are here given.

OFFICE OF STATE BOARD OF HEALTH,
APPLETON, WIS., May 1, 1880.

To the Clerk of the Local Board of Health, or the Town, Village or City Clerk:

DEAR SIR — In asking for the regular annual reports from the local health boards, blank forms for making which are herewith enclosed, the State Board of Health takes the opportunity of acknowledging the greatly increased care and pains which have been taken to secure correct results, and also the fact that returns have been received at this office from every county in the state with a single exception, and from a largely increased number of officers. To all who have entered into communication with this office, and especially to those who have furnished information in addition to that required by law, the board return sincere thanks, and trust that those, comparatively few in num-

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ber, who have hitherto neglected the duty which the law imposes on them of making the returns required, will give no reason for a charge of willful omission hereafter.

Information now in possession of this board gives reason for fearing that small-pox, a disease from which Wisconsin has for some time past been wholly free, may again be brought into the state. In view of this possibility, and of the fact that in many parts of the state this board is compelled to rely entirely on the clerks of local boards for its knowledge of this and kindred diseases, it is hoped that neither time nor pains will be spared in making the reports to the state board as full and accurate as is possible. The difficulties in the way of executing this task are well understood and fully appreciated by the board, but the advantages of your position for its performance are greater than those of any other officer, and the value of the service rendered to the people of the whole state by its proper execution cannot be over-estimated.

Chapters LVI and LVII, sections 1410 and 1411 of the revised statutes provide that, whether any formal organization have been effected or not, the local authorities duly elected and qualified shall constitute local boards of health, and as such shall exercise all the powers and perform all duties pertaining thereto. Under those provisions, whether special action has been taken or not, you are the clerk of the board of health in your city, town or village, and in that capacity you are required "to report at least once a year to the state board" the transactions of your local board and "such other facts as shall be required," and also "to make special reports" whenever the state board shall call upon you, following the instructions of this office in all cases. Upon this point the law is imperative and explicit. The duty is inseparable from your office, and is to be performed whether any formal organization of the board has been effected or not. Any necessary expense attached to its performance is properly chargeable upon your official account.

The intention of the chapters of the revised statutes already referred to is to bring the state and local health boards into active sympathy and coöperation with each other, and render their union close and efficient. They confer the most ample powers upon the local boards, constituting them the guardians of the people's health, and laying great responsibility upon them in their several jurisdictions.

In accordance with these laws you are requested to fill out the duplicate blanks sent herewith, returning one copy to this office, and placing the other on file in your own for future reference. Duplicates of previous years should be among your official papers, and should prove helpful in making the present returns.

If a health officer has been appointed in your town, as has been constantly recommended by this board, consultation with him, especially in regard to any facts concerning the particular diseases named in the report, will render

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your returns more valuable. Any voluntary communication in addition to the more formal report, will be welcome, will receive careful consideration, and will be regarded as confidential if so desired.

In the fourth annual report of this board (a copy of which has been mailed to your address to be placed on file in your office), are published a number of interesting and valuable extracts from such communications as those mentioned above.

Any of the circulars or other publications of this board will be cheerfully forwarded for gratuitous distribution upon application to this office. Many thousands of the circulars on small-pox, diphtheria and scarlet fever have been thus circulated in the state, and the liberal distribution of these circulars is recommended whenever these diseases are prevalent in any community. A circular on the care of infants will also be furnished on application.

By direction of the State Board of Health.

J. T. REEVE, M. D,
Secretary.

ANNUAL REPORT OF THE CLERK OF THE BOARD OF HEALTH FOR THE YEAR ENDING MAY 31, 1880.

To the Secretary of the State Board of Health:

SIR — The territory for which this report is made includes the corporate limits of the[1] ——— of ——— in the county of ———, containing about ——— acres of land. Its population numbers about ——— inhabitants, and is composed chiefly of[2] ———. Their principal occupation is———.

About ——— of the land included in the above limits was originally covered with timber, chiefly ———. About ——— still remains covered with timber, and during the last year the timber has been removed from about ——— acres. There are now under cultivation about ——— acres. The nature of the soil is ———, and the crops chiefly raised are ———. It is[3] ——— watered by the following streams and bodies of water, to wit: ———.

I estimate the number of acres of low or wet land from swamps, etc., to be now about ———. The proportion of this land which is capable of being efficiently drained is ———, and the number of acres of originally wet or low land that have been thoroughly drained during the last year is about ———. In this locality the drinking water is derived chiefly from ———, and the quality of the water is[4] ———; the wells are of the average depth of ——— feet.

The proportion of dwellings having cellars which are wet either habitually or in wet weather is ———.

[1] Insert township, village, or city. [2] Give approximate proportion of nationalities represented. [3] Insert poorly, well, abundantly, etc. [4] Hard or soft.

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Secretary's Report.

The average distance of privies from dwelling houses is ——— feet. The average distance of privies from the source of water supply is ——— feet; the least distance in any known case is ——— feet.

The diseases which have been most prevalent in this community during the last year have been ———.

Upon the whole the amount of sickness has been[5] ——— than has averaged for some years past, and the number of deaths has been[5] ———.

There have been in this[1] ——— during the last year, to the best of my knowledge and belief:

——— cases of, and ——— deaths from *Small Pox*, and there are now sick with this disease ——— cases.

——— cases of, and ——— deaths from *Diphtheria*, and there are now sick with this disease ——— cases.

——— cases of, and ——— deaths from *Scarlet Fever*, and there are now sick with this disease ——— cases.

——— cases of, and ——— deaths from *Typhoid Fever*, and there are now sick with this disease ——— cases.

——— cases of, and ——— deaths from *Measles*, and there are now sick with this disease ——— cases.

———cases of, and ——— deaths from *Whooping Cough*, and there are now sick with this disease ——— cases.

The origin of the above cases so far as known was ———.

The diseases prevailing at the date of this report, other than those above enumerated, are ———.

This board of health has appointed Doctor ——— as its health physician. His post-office address is ———. He is paid a salary of $——— per year.

During the past year this board has held ——— regular or special meetings, and its most important acts have been ———.

My post-office address is ———.

Dated ———.

Signature ——— ———.

Clerk of the Board of Health for the[1] ——— *of* ———, *State of Wisconsin.*

Any additional information on matters pertaining to health, written on a separate sheet, will be thankfully received, especially on the following points:

Reports of any cases of disease clearly traceable to local causes; such as impurity of drinking water from decomposing animal or vegetable matter, unhealthy food, stagnant water, etc.

Reports of an extraordinary amount of sickness or of unusual fatality in special localities. Instances of spread of contagious diseases in any unusual manner, etc.

[5] Insert greater or less, giving proportion if possible.

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Secretary's Report.

Reports of cases of sickness or of death, the origin of which is clearly traceable to the occupation of the individuals.

Report of unusual sickness or fatality among animals.

Instances of injury to life or property from kerosene oil or other explosive burning fluids.

Any cases of sickness among children caused by defects in school houses, overcrowding, overstudy, etc.

Any epidemic spread or supposed to have been spread through schools.

Your opinion as to the principal sources of danger to the health of the citizens in your locality, and suggestions whereby the local causes of disease may be removed, etc.

Please give here your best estimate of the average cost of each case of sickness in your community, including as follows: Medicine and medical attendance, $——. Hired assistance, $——. Loss of time at its fair value, $——. Also the further cost of each funeral in case of death, $——. (Although great accuracy cannot be expected in the answers to this question, your estimate of the above, however imperfect, is nevertheless desired as having a bearing upon the cost of sickness to the communities and to the state)

In the following list the names of all towns, cities and villages from which reports have been received are arranged in alphabetical order. Their number is 853, as against 795 in 1879, 687 in 1878, and 556 in 1877. Every county in the state is represented in these returns, which are in all respects the fullest and most satisfactory as yet received by the board. From the counties of Ashland, Bayfield, Crawford, Douglas, Dunn, Green, Green Lake, Kenosha, La Fayette, Langlade, Lincoln, Marathon, Milwaukee, Ozaukee, Polk, Price, Racine, Taylor, Washington and Winnebago, twenty in all, the returns are complete, reports having been received from every town; while eighteen other counties, viz.: Adams, Barron, Buffalo, Burnett, Calumet, Chippewa, Door, Juneau, La Crosse, Monroe, Oconto, Pepin, Pierce, Rock, Sauk, Shawano, Walworth and Waushara, lack only one town each of being complete.

LIST OF CITIES, TOWNS AND VILLAGES FROM WHICH REPORTS HAVE BEEN MADE FOR THE YEAR ENDING MAY 31, 1880.

Adams County—Adams, Big Flats, Dell Prairie, Easton, Leola, Lincoln, Monroe, New Chester, New Haven, Preston, Quincy, Richfield, Rome, Springville, Strong's Prairie.

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Ashland County — Ashland, Butternut.

Barron County — Barron, Cedar Lake, Clinton, Dallas, Maple Grove, Prairie Farm, Shetek, Stanfold, Sumner.

Bayfield County — Bayfield.

Brown County — Allouez, Ashwaubenon, Bellevue, Depere (town), Depere (village), Eaton, Glenmore, Green Bay (city), Holland, Howard, Humboldt, Lawrence, Morrison, New Denmark, Pittsfield, Preble, Rockland, Scott, Suamico, West Depere.

Buffalo County — Alma (town), Alma (village), Belvidere, Buffalo (town), Buffalo (city), Canton, Cross, Dover, Fountain City, Gilmanton, Glencoe, Lincoln, Maxville, Milton, Montana, Naples, Nelson, Waumandee.

Burnett County — Bashaw, Marshland, Trade Lake, Wood Lake.

Calumet County — Brillion, Brothertown, Charlestown, Chilton (city), Harrison, New Holstein, Rantoul, Stockbridge, Woodville.

Chippewa County — Anson, Auburn, Big Bend, Chippewa Falls, Eagle Point, Edson, Flambeau, La Fayette, Sigel, Wheaton.

Clark County — Beaver, Eaton, Fremont, Hewitt, Hixon, Lewis, Loyal, Mayville (including village of Dorchester), Mentor, Pine Valley, Sherman, Sherwood Forest, Thorp, Warner, Washburn, Weston, York.

Columbia County — Arlington, Caledonia, Columbus (city), Columbus (town), Courtland, Dekorra, Fort Winnebago, Kilbourn City, Leeds, Lewiston, Lodi, Lowville, Marcellon, Newport, Otsego, Pacific, Portage City, Randolph, Scott, Springvale, West Point, Wyocena.

Crawford County — Bridgeport, Clayton, Eastman, Freeman, Haney, Marietta, Prairie du Chien, Scott, Seneca, Utica, Wauzeka.

Dane County — Albion, Berry, Black Earth, Blooming Grove, Blue Mounds, Bristol, Christiana, Cottage Grove, Cross Plains, Dane, Deerfield, Dunkirk, Dunn, Fitchburg, Madison (city), Madison (town), Mazomanie, Medina, Montrose, Oregon, Perry, Pleasant Springs, Primrose, Roxbury, Rutland, Springdale, Stoughton, Sun Prairie (town), Vermont, Verona, Vienna, Westport, Windsor, York.

Dodge County — Ashippun, Beaver Dam (city), Beaver Dam

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(town), Burnett, Calamus, Clyman, Elba, Emmett, Fox Lake, Herman, Hustisford, Juneau (village), Lebanon, Le Roy, Lomira, Lowell, Oak Grove, Portland, Randolph (village), Rubicon, Shields, Theresa, Waupun (city), Westford, Williamstown.

Door County — Bailey's Harbor, Brussels, Clay Banks, Egg Harbor, Forestville, Gardner, Gibraltar, Jacksonport, Liberty Grove, Sevastopol, Sturgeon Bay, Union, Washington.

Douglas County — Superior.

Dunn County — Colfax, Dunn, Eau Galle, Elk Mound, Grant, Hay River, Lucas, Menomonie, New Haven, Otter Creek, Peru, Red Cedar, Rock Creek, Sand Creek, Sheridan, Sherman, Spring Brook, Stanton, Tainter, Tiffany, Weston.

Eau Claire County — Augusta, Drammen, Fairchild, Lincoln, Ludington, Otter Creek, Pleasant Valley, Seymour, Union, Washington.

Fond du Lac County — Auburn, Ashford, Byron, Calumet, Eden, Eldorado, Empire, Fond du Lac (city), Fond du Lac (town), Forest, Friendship, Metomen, Osceola, Ripon (city), Ripon (town), Rosendale, Springvale, Taycheedah.

Grant County — Beetown, Bloomington, Boscobel, Cassville, Castle Rock, Clifton, Ellenboro, Fennimore, Glen Haven, Harrison, Hazel Green, Hickory Grove, Jamestown, Liberty, Lima, Little Grant, Marion, Millville, Mt. Ida, Muscoda, Paris, Patch Grove, Platteville (city), Smelzer, Waterloo, Woodman, Wyalusing.

Green County — Adams, Albany, Brooklyn, Cadiz, Clarno, Decatur, Exeter, Jefferson, Jordan, Monroe, Mt. Pleasant, New Glarus, Spring Grove, Sylvester, Washington, York.

Green Lake County — Berlin (city), Berlin (town), Brooklyn, Green Lake, Kingston, Mackford, Manchester, Marquette, Princeton, Ste. Marie, Seneca.

Iowa County — Clyde, Dodgeville, Eden, Highland, Mifflin (village), Mineral Point (town), Pulaski, Ridgeway, Waldwick, Wyoming.

Jackson County — Albion (including village of Black River Falls), Alma, Franklin, Hixton, Manchester, Melrose, Millston, Northfield, Springfield.

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Jefferson County — Aztalan, Cold Spring, Farmington, Hebron, Ixonia, Jefferson, Koshkonong, Milford, Palmyra, Sullivan, Sumner, Waterloo (village), Watertown (city), Watertown (town).

Juneau County — Armenia, Clearfield, Fountain, Germantown, Kildare, Kingston, Lemonweir, Lindina, Lisbon, Lyndon, Mauston, Necedah, New Lisbon, Orange, Plymouth, Seven Mile Creek, Summit, Wonewoc.

Kenosha County — Brighton, Bristol, Kenosha, Paris, Pleasant Prairie, Randall, Salem, Somers, Wheatland.

Kewaunee County — Ahnapee (town), Carlton, Franklin, Kewaunee (town), Kewaunee (village), Lincoln, Pierce, Montpelier, Red River, West Kewaunee.

La Crosse County — Bangor, Barre, Burns, Campbell, Farmington, Greenfield, Hamilton, Holland, Onalaska, Shelby, Washington.

La Fayette County — Argyle, Belmont, Benton, Blanchard, Darlington, Elk Grove, Fayette, Gratiot, Kendall, Monticello, New Diggings, Seymour, Shullsburg, Wayne, White Oak Springs, Willow Springs, Wiota.

Langlade County — Carpenter, Langlade, Springbrook.

Lincoln County — Ackley, Corning, Jenny, Pine River, Rock Falls.

Manitowoc County — Cato, Centreville, Cooperstown, Eaton, Franklin, Gibson, Kossuth, Liberty, Manitowoc Rapids, Maple Grove, Meeme, Mishicott, Rockland, Schleswig, Two Creeks, Two Rivers (city), Two Rivers (town).

Marathon County — Bergen, Berlin, Brighton, Easton, Hamburg, Holden, Hull, Knowlton, Maine, Marathon, Mosinee, Rib Falls, Rietbrock, Spencer, Stettin, Texas, Wausau (city), Wausau (town), Weston, Wien.

Marquette County — Buffalo, Crystal Lake, Douglas, Harris, Mecan, Montello, Moundsville, Neshkoro, Oxford, Packwaukee, Westfield.

Milwaukee County — Franklin, Granville, Greenfield, Lake, Milwaukee (city), Milwaukee (town), Oak Creek, Wauwatosa.

Monroe County — Adrian, Angelo, Byron, Clifton, Glendale, Jefferson, La Fayette, La Grange, Leon, Lincoln, Little Falls, New

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Lyme, Oakdale, Portland, Ridgeville, Sheldon, Sparta, Wellington, Wells, Wilton, Tomah (town), Tomah (village).

Marinette County — Peshtigo.

Oconto County — Little Suamico, Maple Valley, Oconto (city), Oconto (town), Pensaukee, Little River, Stiles.

Outagamie County — Appleton (city), Black Creek, Bovina, Buchanan, Centre, Cicero, Dale, Deer Creek, Ellington, Freedom, Grand Chute, Greenville, Liberty, Maine, Maple Creek, Osborn, Seymour (city), Seymour (town).

Ozaukee County — Belgium, Cedarburg, Fredonia, Grafton, Mequon, Port Washington, Saukville.

Pepin County — Durand (village), Frankfort, Lima, Pepin, Stockholm, Waterville, Waubeck.

Pierce County — Clifton, Diamond Bluff, Ellsworth, El Paso, Gilman, Hartland, Isabelle, Maiden Rock, Martell, Oak Grove, Prescott (city), River Falls, Rock Elm, Salem, Spring Lake, Trimbelle, Union.

Polk County — Alden, Apple River, Balsam Lake, Black Brook, Clam Falls, Clayton, Eureka, Farmington, Georgetown, Laketown, Lincoln, Lorraine, Luck, Milltown, Osceola, St. Croix Falls, Sterling, West Sweden.

Portage County — Alban, Almond, Amherst, Belmont, Eau Pleine, Grant, Hull, Newhope, Pine Grove, Plover, Sharon, Stevens Point (city), Stevens Point (town), Stockton.

Price County — Branon, Fifield, Worcester.

Racine County — Burlington, Caledonia, Dover, Mt. Pleasant, Norway, Racine, Raymond, Rochester, Waterford, Yorkville.

Richland County — Akan, Bloom, Buena Vista, Dayton, Eagle, Forest, Henrietta, Ithaca, Marshall, Orion, Richland, Richwood, Rockbridge, Westford, Willow.

Rock County — Avon, Beloit (city), Beloit (town), Bradford, Centre, Clinton, Evansville, Fulton, Harmony, Janesville (town), Johnstown, La Prairie, Lima, Magnolia, Milton, Newark, Plymouth, Porter, Rock, Spring Valley, Turtle, Union.

St. Croix County — Baldwin, Cady, Cylon, Eau Galle, Erin Prairie, Hammond, Hudson, New Richmond (town), Pleasant Valley, Star Prairie, Somerset, Springfield, Stanton, Troy, Warren.

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Sauk County — Baraboo (village), Bear Creek, Dellona, Delton, Excelsior, Fairfield, Franklin, Freedom, Greenfield, Honey Creek, Ironton, La Valle, Merrimac, Prairie du Sac, Reedsburg, Sauk City, Spring Green (town), Spring Green (village), Sumpter, Troy, Washington, Westfield, Winfield.

Shawano County — Almon, Angelica, Belle Plain, Fairbanks, Grant, Green Valley, Hartland, Herman, Hutchins, Milltown, Lesser, Maple Grove, Navarino, Pella, Richmond, Seneca, Shawano (city), Washington, Waukeechon.

Sheboygan County — Greenbush, Herman, Holland, Lima, Lyndon, Mitchell, Mosel, Plymouth (city), Rhine, Sheboygan (city), Sheboygan (town), Sheboygan Falls (town), Sheboygan Falls (village), Sherman, Wilson.

Taylor County — Chelsea, Little Black, Medford, Westborough.

Trempealeau County — Albion, Caledonia, Dodge, Ettrick, Hale, Lincoln, Pigeon, Preston, Sumner, Trempealeau, Unity.

Vernon County — Bergen, Christiana, Clinton, Coon, Forest, Franklin, Genoa, Greenwood, Hamburg, Hillsboro, Jefferson, Kickapoo, Liberty, Stark, Sterling, Union, Webster, Wheatland, Whitestown.

Walworth County — Bloomfield, Darien, Delavan, East Troy, Elkhorn, Geneva, La Fayette, La Grange, Linn, Lyons, Richmond, Spring Prairie, Sugar Creek, Troy, Walworth, Whitewater.

Washington County — Addison, Barton, Erin, Farmington, Germantown, Hartford, Jackson, Kewaskum, Polk, Richfield, Schleisingerville, Trenton, Wayne, West Bend (town), West Bend (village).

Waukesha County — Brookfield, Eagle, Lisbon, Merton, Mukwanago, Muskego, New Berlin, Ottawa, Oconomowoc (city), Oconomowoc (town), Pewaukee, Summit, Vernon, Waukesha (town), Waukesha (village).

Waupaca County — Bear Creek, Caledonia, Dayton, Dupont, Farmington, Fremont, Helvetia, Iola, Larrabue, Lind, Matteson, Mukwa, Royalton, St. Lawrence, Union, Waupaca (town), Weyauwega.

Waushara County — Aurora, Coloma, Dakota, Deerfield, Han-

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cock, Leon, Marion, Mt. Morris, Oasis, Plainfield, Poysippi, Richford, Rose, Saxville, Springwater, Warren, Wautoma.

Winnebago County — Algoma, Black Wolf, Clayton, Menasha (city), Menasha (town), Neenah (city), Neenah (town), Nekimi, Nepeuskun, Oshkosh (city), Oshkosh (town), Omro, Poygan, Rushford, Utica, Vinland, Winchester, Winneconne, Wolf River.

Wood County — Auburndale, Centralia (city), Grand Rapids (town), Lincoln, Marshfield, Port Edwards, Remington, Rock, Seneca, Sigel, Wood.

PREVENTABLE DISEASES.

In the following table are given the statistics of preventable diseases in Wisconsin, as shown by the returns received at the secretary's office, from the clerks of the local health boards above named:

TABLE I.

	Small Pox.	Diphtheria	Scarlet Fever.	Typhoid Fever.	Measles.	Whooping Cough.
Number of towns reporting...	8	403	241	276	240	251
Number of cases reported....	9	7,031	2,778	1,362	3,954	4,135
Number of deaths reported ...	2	1,410	336	281	60	73

In the above table the numbers given are the aggregates from the actual figures reported from the several towns. In addition thereto we have to estimate as accurately as is possible the cases which have occurred in towns where the returns have indicated the prevalence of one, two or more of these diseases, but in indefinite terms; such language as "several, few, many, very many, some," and the like, being used, so that the reports could not be included in the above table. If, however, it be assumed that in the towns thus indefinitely reporting the number of cases of these diseases, and the mortality resulting from them, were equal to the average sickness and mortality from the same causes in the towns from which definite returns were made, an assumption that seems entirely

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legitimate, we shall have, upon making the calculation and adding the results to the figures already given, the following table, as representing the amount of sickness and death during the year from the six specified diseases in 852 cities and towns of Wisconsin, the city of Milwaukee being omitted here for reasons to be presently mentioned:

TABLE II.

	Small Pox.	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Measles.	Whooping Cough.
Whole No. of towns reporting	3	515	264	297	273	297
Probable No. of cases.....	9	7,811	3,043	1,467	4,499	4,894
Probable No. of deaths.....	2	1,566	368	303	68	86

In the city of Milwaukee, which has an efficient health department, monthly returns of mortality are made by the head of that department, which are probably close approximations to perfection. The figures drawn from these returns have thus far been omitted, 1st, for the purpose of placing in the strongest possible light the prevalence of certain forms of disease in the less densely populated portions of the state; and 2d, because in the monthly reports from Milwaukee deaths only find place, the number of cases ending in recovery not being given. Taking the available figures, however, assuming that the proportion of fatal cases to those ending favorably has been the same in Milwaukee as in other parts of the state, and adding the results of the calculation to the figures already given, we shall have the following table showing the amount of sickness and death during one year, in an area equal to about eight-ninths of the state, from diseases some of which sanitarians believe to be *entirely* preventable, and all of which are undoubtedly capable of being so greatly restricted that they will cease to be, as in the past they have been, the scourges of whole communities. The noticeable progress already made in this direction affords good encouragement for the continuance of sanitary labor.

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TABLE III.

	Small Pox.	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Measles.	Whooping Cough.
Whole No. of towns reporting	8	516	265	298	274	298
Probable No. of cases...	9	8,878	3,225	1,549	4,565	5,406
Probable No. of deaths.....	2	1,780	390	320	69	95

In connection with these tables the following facts, also collated from the reports made by the clerks of local health boards, are of interest: Of the whole number of towns reporting, one hundred and seventy-five have enjoyed entire freedom during the year from all of the maladies named in the tables; two hundred and twenty-four localities have been visited by some one of them; one hundred and eighty-nine places have suffered from the presence of two; in one hundred and fifty communities three have prevailed to a greater or less extent; seventy-one townships have been scourged by four and thirty others by five of them. No single place has been afflicted by the visitations of the whole six during the year. The very small number of cases of small-pox which have been reported, and which we have strong grounds for believing are all that have occurred in the state during the year, furnishes a subject on which the people of Wisconsin may well be congratulated. Careful inquiry into the origin of all cases of this disease showed that in every instance it had been imported from without, one case having been contracted in New Brunswick, another from a passing emigrant wagon, and a third during a railroad journey through Illinois. *In every case prompt isolation and strict quarantine prevented any spread of the disease* beyond the limits of the families in which it first appeared.

Diphtheria, however, a disease which by the same careful isolation of the patients, and the adoption of the means urgently recommended by this board and by many other state boards of health, may be very greatly restricted in its ravages, yet retains its bad

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pre-eminence, the deaths reported from it numbering more than twice as many as those occasioned by the remaining five diseases taken together. By all the means at its command this board has endeavored to spread among the people of the state a knowledge of the eminently infectious and contagious character of diphtheria, and has persistently urged the adoption of the precautions which have again and again proven effective in its restriction. That these precautions have been adopted to some extent, and that the prudence of those adopting them has been fully vindicated by the results, the board has good reason for believing; the following extract from a letter received not long since at the secretary's office being one among many gratifying evidences of that fact: "There have been several cases of diphtheria in a public institution here, brought in from outside, but not a single additional person was affected. The means used to bring about this most desirable result were, *general cleanliness, a liberal use of disinfectants and* CAREFUL ISOLATION OF EVERY PATIENT."

This disease will, however, continue to invade our households and to carry off a cruelly unnecessary annual quota of victims until the people shall be convinced that it is capable of being controlled by isolation. A correspondent — not a medical man — says in speaking of this subject: "So hard is it to convince people that diphtheria is a contagious disease, that they will not only have public funerals in case of death from it, but will keep the bodies until all the relatives can be gathered together. Of course these carry the infection home with them, and in a short time some of them are stricken down; *their* friends and acquaintances are called in, in turn, and so the contagion spreads. Yet folks will not see what lies directly before their eyes, but say that the cause is in the air; if they are to have diphtheria they will have it anyhow, and if not they will escape: it makes no sort of difference, in their view, whether they go where the disease is or stay away! Not very long ago in a town near by, a girl died from diphtheria, and her body was kept, as usual, till all her friends could be assembled, and was then taken to another town, where no case of the malady had occurred for several years, and there buried with a large attendance

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and a good deal of ceremony. The whole thing may do good in the end, for the people of the town in which the funeral took place are exasperated at being exposed to such a risk, and it is possible that something may be done to prevent a similar occurrence in future." Another report says: "Diphtheria has raged in one quarter of this town, but nothing was done, although the health board was properly notified of its existence. The people are very careless, moreover, going from house to house where it exists, taking no precautions whatever; some, indeed, claiming that precautions are of no use. So it goes; diphtheria spreads and people die!" And yet a third communication contains the following passage: "Diphtheria is raging with fatal effect near us, and will probably increase greatly during the fall and winter, as nearly or quite all of the funerals of those who die from it are public, and no precautions of any kind are taken against its spread."

Now it is entirely safe to say that whenever and wherever laxity such as that described in the extracts just quoted prevails, and is not only tolerated but justified by public sentiment, then and there will diphtheria hold high carnival; and that when the people learn, as it is earnestly hoped they will learn, that this is a highly contagious disease, capable of being spread from person to person and carried from place to place, and that when it is as carefully isolated as a case of small-pox is isolated at the present time, its progress may, and doubtless will be, greatly restricted, and multitudes of lives saved thereby.

The circular upon diphtheria, published by the board and printed in previous annual reports, continues to be in great demand, a new edition of ten thousand copies having been printed during the year. This circular has met with singular favor outside of Wisconsin, having been reprinted in several other states, and many thanks have been tendered to this board for the benefits derived from its teachings.

COST OF PREVENTABLE DISEASE.

In previous reports an attempt has been made to estimate the actual cost, in cash, to the community, of some portion of the disease which annually occurs in our own state. With this end in

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view, requests have been appended to the blanks intended for the reports from local boards, asking for information as to the amounts expended for medical attendance and medicine, for any extra help rendered necessary by reason of the existence of sickness in a family, and for funeral expenses in case of death, together with an estimate of the average value of the time lost by the occurrence of sickness. Answers to these questions were received from between two hundred and three hundred places, and the average of all the various figures given has been taken as fairly representing the cost of a case of sickness anywhere within the state. Using the figures thus obtained as a basis (and it is to be remembered that they are drawn from the estimates of men who have at least more than average opportunities for judging with great accuracy), and upon the hypothesis that the cost of sickness and death is uniform all over the state, including the larger cities, we shall have the following sums to represent the actual money expenditure on account of six preventable diseases in Wisconsin during a single year:

Cost of cases ending favorably	$2,060,982
Cost of cases ending fatally	345,625
Total cost	$2,406,607

an amount which exceeds the sum expended in Wisconsin during the year ending August 31, 1879, for building and repairing school houses, school furniture, registers and records, apparatus and libraries, teachers' salaries, and all other purposes connected with the schools and educational institutions of the state, by more than a quarter of a million of dollars.

Nor is this by any means the whole cost. The absolute loss to the community of a large amount of productive labor during the time of sickness, and the further irreparable loss occasioned by death, must also be taken into the account. During the existence of slavery, the value at birth of a healthy child of either sex was reckoned in the southern states at one hundred dollars, and the value of an able-bodied field hand was at least one thousand dollars. Political economists, without exception, rate the value of free labor as being very much greater than that of slave or enforced

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labor of any kind, other things being equal, and it must also be remembered that the value of a man to the community in which he lives rises in a very rapidly increasing ratio with any peculiar skill or knowledge of which he may be possessed. Therefore, the value of an ordinarily well educated freeman is at the lowest estimate double that of a totally ignorant slave; and the worth to the state of a man such as the late Prof. Carpenter, a victim of one of the diseases of this class, for instance, is beyond all computation. Placing the money loss to the state, however, at fifteen hundred dollars *per capita* for all who have died from the six diseases in the period of time represented by our tables, an estimate which is an exceedingly low one, we shall have a sum *very nearly approaching four millions*[1] as the absolute and irrecoverable loss to the state on this account during a single year. And if to this be added the further amount lost by reason of the withdrawal from active labor for a longer or shorter time of those who finally recovered — an amount not taken into consideration at all hitherto, — we shall probably have an aggregate loss of *not less than ten millions of dollars annually, to be charged to the account of one class of preventable diseases only, in the state of Wisconsin.*

Let it be granted that it is a low view to take of such matters — that it is even humiliating thus coolly to estimate in money the value of human life,— it is still true that "aggregate personal loss is the suffering of the community;" and we may therefore properly ask whether such considerations as the above are not worthy of careful thought by all classes of our citizens, and whether means are not well applied which have for their object the saving of a large part of this enormous tax on literally the vital resources of the state?

OTHER PREVALENT DISEASES.

Many of the reports for the past year, in addition to the diseases specifically inquired for, refer to the fact of an unusual prevalence of other maladies, among which consumption and pulmonary disorders generally are mentioned with considerable frequency. One

[1] Precisely $3,984,000.

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hundred and fifty reports in all, make note of the prevalence of affections of the respiratory organs to an unusual extent; sixty-eight mention the occurrence of malarial disorders with uncommon frequency, and thirty-six speak of diarrhœa and dysentery as appearing with severity in their respective localities, while infantile diseases have attracted attention in a small number only of townships.

The large number of reports in which reference was made to consumption, etc., the brief notes which accompanied many of these, some expressing a fear that changing conditions of climate were operating to cause an increase, some simply calling attention to the number of cases, led to particular inquiry into the real state of things by means of the following circular to special correspondents:

OFFICE OF THE STATE BOARD OF HEALTH,
APPLETON, WIS., August 6, 1880.

DR ——:

DEAR SIR — In asking you again for information in regard to the sanitary conditions prevalent in your neighborhood, the State Board of Health desires to renew its acknowledgments for the services hitherto rendered by its corps of special correspondents — services which have not only been of value to the board in the prosecution of its work, but have furnished information of interest and use to many into whose hands the reports of the board have fallen.

A very considerable number of the reports received from clerks of local health boards for the past year, speak of a marked increase in the number of cases of phthisis; others make mention of pneumonia and kindred diseases as having prevailed to an unusual extent, while still others report an increased number of malarial disorders of various types. Such accounts are well calculated to cause anxiety on the part of those who are watching the fluctuations of disease in our state, and, should they prove true, the changed or changing conditions of soil, climate, etc., which produce the increase of these maladies, cannot fail to have an important influence on the material welfare of the commonwealth.

The board, therefore, while desiring from its special correspondents a comprehensive report covering the general health conditions of their respective localities, made in such form as each one may prefer, will be glad to have answers as specific as possible to the following inquiries:

1. Has there been any special increase in phthisis, pulmonary diseases generally, or in diseases of malarial origin, in your own practice within the past year?

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2. Have you any reason to think that cases of the above named diseases are increasing in number in your neighborhood to any marked extent?

3. If so, do you attribute the increase to any special cause, *e. g.*, to any change in the habits or modes of life of the people — to any increased influx of immigrants affected by such diseases, or to any changed conditions of the soil or climate? Has there been, during any considerable part of the year, any notable difference in atmospheric conditions or in the amount of soil moisture as compared with previous years?

4. Has there been any marked increase or decrease in the total amount of sickness in the territory under your observation as compared with previous years? If either, please give an approximate estimate of its proportions. Have the diseases which commonly prevail been either greater or less in amount or severity than in former years?

5. Has there been any increase or decrease in the number of zymotic or preventable disease? The history of any epidemic of such diseases is especially desired, with an account of the supposed origin or cause thereof, together with any facts showing the means of communication from one person or place to another, and any suggestions which you may have to offer for the prevention or restriction of such maladies.

The board desires information on the above or any other matters pertaining to the public health, not alone for its own information and guidance, but that it may use in its next annual report such extracts from communications as may be of general interest. No publication, whether of facts or names, will be made, however, should a desire be expressed that the information given may be regarded as confidential.

A stamped envelope is enclosed, which please use for your reply, leaving any excess of postage to be paid here. An early answer is solicited.

By order of the State Board of Health.

Very respectfully yours,

J. T. REEVE, M. D., *Secretary.*

Extracts from many of the communications received in response to the above circular are given elsewhere, as also a summary of the information contained in the remainder. One letter, however, from Dr. H. T. Godfrey, of Benton, is deserving of such special attention that we present it here. Going as it does to the root of the matter, it will help to remove the fear apparently entertained by some, that consumption is increasing among us by reason of any climatic or similar change of conditions, or that Wisconsin is becoming for any reason whatever a less healthy and desirable state for permanent residence than it has been hitherto. Dr. Godfrey writes:

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"I think that cases of phthisis pulmonalis are decidedly more numerous than they formerly were amongst us. But this apparent increase of consumption must be attributed to a very great extent to the change in the character of the population rather than to any increase in unsanitary conditions. This country was settled about forty years ago by miners and others, drawn from the most robust of their class in England, Ireland, and the eastern portions of our own country. Only those in the highest physical vigor came here, prepared to rough it and to endure any and every privation in the pursuit of wealth; few, comparatively, made homes, and those attacked by sickness went away to recover or die, as the case might be. For the last twenty years or thereabouts, however, agriculture has become more and more of a leading industry; homes have been made and families founded; hence our population, instead of being composed of hardy pioneers solely, is now, like that of older settlements, a mixture of strong and weak, and we keep our sickness, consumption included, at home.

"But more than this, we have now reached a stage when we are sending out our younger and more vigorous men to the still newer states and territories, there to play the part of pioneers; these, if they become the subjects of disease, return home either to be nursed back to health or to have their eyes closed, and the last sad offices of affection performed by the hands most near and dear to them, and to swell the returns of death. All these facts and circumstances must be taken into consideration, and all go to render any estimate fallacious which depends on figures alone."

LOCAL BOARDS OF HEALTH.

It is a subject of regret that so few townships have seen the necessity for the establishment, by their own action, of local health boards which shall exercise jurisdiction over the sanitary surroundings of each independent municipality. "Our town is so healthy," it is frequently said, "that there is nothing whatever for a board of health to do," there being meanwhile, all over the same town, wells, privy-vaults and cess-pools in close proximity to each other, constantly making a free and friendly interchange of their

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several contents; undrained back-yards, where typhoid germs are lurking, waiting their time and victims; school-houses and churches that seem to have been specially designed for the slow murder of their occupants; stables and barn-yards, poisoning the water of streams that otherwise would be pure and wholesome; perhaps here and there a slaughter-house, such as that described by a correspondent in this report, under which the soil is saturated with putrefying blood and offal; dwelling-houses ill-built, badly warmed, unventilated and undrained; all these alike being engaged in the work of lowering the vitality of the inhabitants, old and young, enfeebling them insensibly but surely, and rendering them easy victims when, by any chance, epidemic or endemic disease makes its appearance among them. It is probable that there are few, if any, towns in Wisconsin where the services of a skilled sanitary inspector would not be of value — a fact that some localities have already discovered, some, indeed, paying a high price for the knowledge in the shape of the lives of their citizens. In this connection two brief notes, attached to reports coming from the same town in two successive years, have significance: "1879. A board of health is needless; the town is too healthy to require any." "1880. A board of health has been found highly necessary to check the spread of diphtheria." And accompanying these were the following figures, representing the cases of disease in the town during the two years in question:

1879.		1880.	
Diphtheria	12 cases.	Diphtheria	45 cases.
Scarlet fever	6 "	Scarlet fever	21 "
Typhoid fever	12 "	Typhoid fever	30 "

Another note says: "We begin now to see the use of a board of health, whereas we formerly thought it a joke;" and there is ground for the hope that other communities are coming to see that it is far better to prevent epidemics than to cure them. A town will, with readiness and alacrity, pay almost any sum to rid itself of small-pox, diphtheria, or scarlet fever, or any kindred disease which may have fastened upon it, and proven not only a serious interruption to business, but a heavy tax upon human life, when

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at a tithe of the final cost the epidemic might have been wholly prevented had proper steps been taken in the beginning, and had a properly organized board been in existence with the authority needed for taking those steps.

The reports of these boards, though made as the law requires by their clerks, have been in many cases the joint production of those officers and of

THE HEALTH OFFICERS

who hold their appointments from the local boards of health. Last year the whole number of such officers of whom this board had any knowledge was but 167, an increase of 37 over the number reported in 1878. The number this year is 207. Very few of these receive any fixed salary. All towns have a legal right to appoint a health officer, and it is matter for continuous regret that so few exercise that right. The difficulties attendant upon securing an officer competent to fill a position where the duties are onerous and often delicate, and where the responsibility is great, are fully appreciated; but it cannot be truthfully questioned that there are very many places in the state where such an officer could be employed with great benefit, and there are probably few localities where no one can be found competent to render service which would greatly benefit the community.

To the officers of this kind who have been appointed, many of whom have done excellent work gratuitously, this office tenders its thanks for valuable information. Some communications from them contained matter of such general interest that we have made extracts from them for publication; these are included with the extracts from the letters of

SPECIAL CORRESPONDENTS,

to whom also we again return very hearty thanks for the continued interest manifested by them in our work. Our list of names of these co-laborers now numbers seventy-four, including representatives in forty-three counties of the state, but, as has been said in previous reports, we desire to establish relations of this character in all parts of the state, and we cordially invite any who are

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interested in the advancement of sanitary science to communicate with this office.

Among those who should be interested in the work of the board, especially in the very extensive field of household hygiene, are the women of the state, some of whom are taking a very active part in the farmers' clubs and agricultural societies, to the proceedings of which they have made interesting and valuable contributions. The board of health of Massachusetts, and, if we mistake not, those of some other eastern states, have been indebted to women for various papers on matters of home living, and we should be pleased to have the women of Wisconsin manifest their interest in our labors in the same way.

LIBRARY.

Since the date of the last report, the library of the board has received the following additions:

By Gift and Exchange of Publications — Biennial Report of the State Board of Health, California, '78 and '79, from F. W. Hatch, M. D., secretary; Transactions of the State Medical Society of New York, 1879, from W. M. Smith, M. D., secretary; Report of the Secretary of State, Wisconsin, 1879, Hon. H. B. Warner; Report of the State Superintendent, 1878, from Hon. W. C. Whitford; Transactions of the Medical Society of the State of Michigan, for 1879, from G. E. Ranney, M. D., secretary; Transactions of the Medical Society of the State of New Hampshire, for 1879, from M. W. Russell, M. D., secretary; Seventh Annual Report of the Northern Hospital for the Insane, from W. Kempster, M. D., superintendent; Second Annual Report of the State Board of Health of Connecticut, from C. W. Chamberlain, M. D., secretary; Vol. 6, Transactions of the Northern Wisconsin Agricultural and Mechanical Convention, from R. D. Torrey, Esq., secretary; Third Annual Report of the State Board of Health of New Jersey, from E. M. Hunt, M. D., secretary; Second Annual Report of the Health Commissioner of the City of Milwaukee, from O. W. Wight, M. D., commissioner; Annual Reports of the Secretary of State of Minnesota, for 1877, 1878 and 1879, from J. K. Hoffmann, Esq.;

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Secretary's Report.

Third Biennial Report of the Board of Health of the State of Maryland, from C. W. Chancellor, M. D., secretary; Wisconsin Blue Book for 1880, from Hon. J. B. Bennett, Wisconsin Senate; Report of a Special Committee on the Water Supply of the City of Cambridge, Mass., from W. S. Barbour, Esq., city engineer; Proceedings of the Conference of Charities for 1875, 1876, 1877, 1878 and 1879, from H. H. Giles, Esq., secretary of the conference; Ninth Annual Report of the State Board of Charities and Reform, from the secretary; Report of the Health Officer of the District of Columbia, from Smith Townshend, M. D., health officer; Twenty-sixth Report upon Births, Marriages and Deaths in the State of Rhode Island, 1878, from C. H. Fisher, M. D., state registrar; Summary of Births, Deaths, Marriages and Still-Births in New York City, as compared with other American and Foreign Cities, by John T. Nagle, M. D., from the author; Circular on Diphtheria, from the Minnesota State Board of Health, from the secretary; Sixth Annual Report of the Railroad Commissioner of Wisconsin, from Hon. A. J. Turner, commissioner; Sanitary Organization of Nations, by H. I. Bowditch, M. D., Boston, Mass., from the author; Report on the Condition of the Water Supply in the First Ward of the City of Racine, by J. G. Meachem, Jr., M. D., from the author; Seventh Annual Report of the Board of Health of the City of New Haven, Conn., from the board; Transactions of the Medical Society of the State of Connecticut, 1879, from C. W. Chamberlain, M. D., secretary; Report of the Board of Health of the State of Louisiana for 1879, from the board; Annual Report of the Board of Education of the City of Oshkosh, 1879–80, from G. H. Read, Esq., superintendent; Thirteenth Annual Report of the Board of Health of the City of Dayton, O., from the board; Annual Report of the Statistics of Mortality and Meteorology of the City of Oakland, Cal., for 1879, from J. B. Trembley, M. D., health officer; Lecture on the Education of Girls and Studies on the Laws of Life, by Nathan Allen, M. D., from the author; State Medicine and State Medical Societies, by S. Chaille, M. D., from the author; Second Annual Report of the State Board of Health of Rhode Island, from he board; First Annual Report of the Board of Health of the

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Taxing District of Shelby County, Tenn. (City of Memphis); Report of the Board of Health of Hudson County, N. J., 1879, from the board; Reports of the Pennsylvania Training School for Feeble-Minded Children, for 1878–79, and Proceedings of the Association of Medical Officers of American Institutions for the Education of the Idiotic and Feeble-Minded, 1876, '77, '78 and '79, from I. N. Kerlin, M. D., Media, Pa.; Eleventh Annual Report of the State Board of Health of Massachusetts, from the secretary; First Annual Report of the Bureau of Statistics and Geology of the State of Indiana, 1879; Annual Report of the Board of Health of the City of Richmond, Va., 1879; First Annual Report of the Board of Health, Lunacy and Charities of the State of Massachusetts, 1880, from the secretary; Eighty-ninth Volume Transactions of the State Medical Society of Connecticut, 1880, from C. W. Chamberlain, M. D., secretary; Practical Hygiene as it Relates to a Proper Water Supply, by I. N. De Hart, M. D., from the author; Papers on Water Supply from the Supplement to the First Annual Report of the Massachusetts State Board of Health, etc., by Prof. W. Ripley Nichols, from the author; Medical and Surgical Directory of the State of Iowa, by C. H. Lathrop, M. D., from the author; Supplement to the First Annual Report of the Board of Health, Lunacy and Charity of the State of Massachusetts, embracing Papers on Public Health, from C. F. Folsom, M. D., secretary; Contamination of Drinking Water by Filtration of Organic Matter through the Soil, by V. C. Vaughan, M. D., from J. K. Allen, Esq., Lansing, Mich.; Thirteenth Annual Report of the Connecticut State Hospital for the Insane, from A. M. Shew, M. D.; A Glance at the Past and Present Condition of the Insane, by A. M. Shew, M. D., from the author; Enumeration, Classification and Causation of Idiocy, by I. N. Kerlin, M. D., Media, Pa., from the author; Transactions of the State Medical Society of Minnesota, from the secretary; Second Annual Report of the State Board of Health of Kentucky, from J. J. Speed, M. D., secretary; Proceedings of the Seventh Annual Conference of Charities and Correction, 1880, from A. O. Wright, Esq., secretary State Board of Charities and Reform; Yellow Fever in U. S. Ship Plymouth, from P. S. Wales, M. D.,

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surgeon-general, U. S. N.; Manual of Laws Relating to Public Health, Model Sanitary Ordinances, References to Laws and Reports Published by the Board of Health of the State of New York, from E. Harris, M. D., secretary; Circulars Regarding Diphtheria and Scarlet Fever, with Rules for Local Health Boards, published by the Board of Health of the State of Iowa, from L. F. Andrews, M. D., secretary.

By Purchase — Plumber and Sanitary Engineer, vol. 3; Scientific Monthly, vols. 16, 17, 18; Transactions American Public Health Association, vol. 5; Richardson's Ministry of Health; Working Men's Homes; Frey's Microscopic Manipulation; Foster's Physiology; Johnson's Chemistry of Common Life; Wilson's Healthy Homes; Hale's Management of Children; Health Primers, 6 vols.; Bible Hygiene; Eveleth's School Houses; Wood's Medical Library, 1879 and 1880.

EXPENSES.

The vouchers which have been examined and have received your approval are numbered from 234 to 298, inclusive, and cover the following expenditures:

Official expenses of members	$662 01
Postage and box rent (including telegraphing)	308 44
Printing	284 74
Books and instruments	136 26
Secretary	1,800 00
Clerical services	300 00
Furniture	15 75
Transportation (freight, express, etc.)	85 77
	$3,542 97

THE PEOPLE AND THE WORK OF THE BOARD.

Among the more prominent and encouraging evidences received that the work of the board is reaching the people and meeting real wants, I may mention the facts that during the year requests for advice in reference to the location, construction, ventilation, etc., of school and other public buildings have been frequently made by school officers and others interested; that the advice of the board

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has also been sought on many occasions in regard to other sanitary questions, and very frequently with reference to the proper measures to be pursued in the limitation of the spread of epidemic disease. Such requests have always received prompt attention, and advice has been given which it is hoped has been serviceable in the particular cases in which it has been asked, and helpful to the interests of general sanitation.

The services of the board have also been called into requisition by a committee of the legislature in the course of an investigation of one of the state institutions, in which the entire board took part, reporting its conclusions to the committee by whom its assistance was desired.

Throughout the entire year, as was the case during a portion of last year, Prof. T. W. Chittenden has been associated with me in the work of this office, and thanks are due to him for the efficient service he has rendered in the discharge of its varied duties.

Very respectfully,

J. T. REEVE, M. D.,
Secretary.

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General Hygienic Knowledge a Necessity for the People.

GENERAL HYGIENIC KNOWLEDGE,

A NECESSITY FOR THE PEOPLE.

Early in the Christian era, Galen announced that the health of the body depended upon an equal and uniform mixture of solids and liquids, and its illness from their disproportion and inequality. He seems to have been the first to intelligently observe and crudely formulate correct ideas of pathology, therapeutics, the causes of disease and the laws governing health and longevity. After his death the doctrines of Hippocrates again obtained prevalence, until the most intelligent men of that time believed that "famine, death, foul air and epidemics were caused by evil spirits." As a result of this condition, the common people sought to ward off impending ills and cure bodily diseases in practices of magic and piety, having recourse to talismans and cabalistic signs to exorcise the evil spirits and obtain the assistance of the good spirits.

At the end of the fourth century, the temples of Æsculapius, Hygeia and Serapis were closed, and the church took more immediate charge of the afflicted.

During the fifth and sixth centuries there were advocates of a regular diet and care in the selection of aliments; of proper habits of life; of pure air; and crude ideas were formulating as to the effects of surroundings upon health and longevity.

In the seventh century the Koran contained in the form of aphorisms some excellent, and, for that time, remarkable principles with regard to physiology and hygiene; but it was not until near the close of the eighth century that there was any regular course of medical instruction, and this was under the direction of the

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church, and controlled by monastic orders. At this time the intercession of saints, the touching of relics, and pilgrimages, were commonly resorted to, not only to cure but to prevent diseases. The reputation of the schools of Monte Casino and Salerno attracted the most able men of their generation as instructors, and they established a limited hygienic code which even now shows a good degree of common sense, the result of good powers of observation and extensive experience.

When what was termed the municipal regime arose upon the ruins of the empire of Charlemagne, the monks saw that their power was threatened by the laymen, and progress was thereby more rapid. Hospitals were founded, and during the eleventh century were rapidly increased by reason of the crusades. It was not until several terrible epidemics had occurred in Europe, in the fourteenth century, that any idea of an organized force was entertained. It was carried into execution by the appointment of a medical police for all countries, and under the joint supervision of church and state. "The well-known black plague, one of the greatest scourges that ever devastated the world, and which originated in the Asian marshes in 1348, ravaged Italy and France, spreading from thence to Germany, England and Holland. * * * Public sanitary measures do not date, however, from this period of general calamity, but from a somewhat later epoch, when the outbreak of various local epidemics caused great apprehension as to the return of the black plague. The closing of houses, streets, and even quarters where the disease had raged, the drawing of a sanitary cordon round the places infected, and, what was still more important, the scientific investigation of the causes of the disease, the cleansing of the sewers and the streets, the purifying of the drinking water, the transfer of the needy sick to some place outside the walls, and the practice of burying the victims of epidemic in quicklime, testify to the prudent precautions of the administration."

In the fifteenth century the populace sought in the occult sciences, especially astrology, a solution of all these vexed questions. "An epidemic was caused by the conjunction of different stars;

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General Hygienic Knowledge a Necessity for the People.

and as the inherent principle of every illness was in the constellation beneath which the sufferer was born, the doctor's first duty was to seek out the constellation, so as to get a basis for his prognosis."

It was near the seventeenth century that the works of Hippocrates and Galen first saw the light by means of the art of printing. From this time on the priesthood rapidly lost control of scientific questions, and laymen more effectually took up the work. Their zeal in investigations, their private teachings, hospital instructions, and, more than all, the system of education in all the principal universities, all of which were in a great degree guided by the wise teachings of these philosophers, gave such an impetus to scientific investigations, that progress up to our present standpoint has been nearly if not quite co-equal with that of the arts. It will be noticed that early in the fourteenth century a police was created to regulate in a limited way the sanitary condition of all countries, and from that to the present time there has been an ever-present conviction that the public should be instructed in those things pertaining to health, comfort and longevity, and that it should be protected by organized bodies to give direction and force to all hygienic or sanitary laws for the public welfare. If life be worth anything, or if its duties require of us the greatest amount of mental and physical vigor, what can be a more profitable study than that of the attainment of a better mental and physical culture — a more vigorous ripe age, divested of many of our physical ills,— a study leading up to a more perfect manhood. Man was made in the image of his Creator — placed upon the earth and surrounded by all those things necessary to his comfort and happiness. That he carry out the purposes of his Creator in the proper and intelligent use of these things — that he recognize his relations to Him, to his brother man, and to society,— is a personal responsibility. To faithfully discharge this trust he should possess the largest amount of information attainable as to the laws and forces governing these relations, and apply them with strict fidelity.

That a general knowledge of hygiene is now felt to be a public necessity is shown by the organization of our National Public

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General Hygienic Knowledge a Necessity for the People.

Health Association, the National Board of Health, State Boards of Health, and the various sanitary commissions and organizations springing up all over the land. The daily and weekly press has caught the spirit of the time, and is now lending its powerful aid in the direction of awakening a more general interest with the people, and is contributing much general information in the way of hygienic knowledge.

Hygiene is a broader field to explore than the first thought would suggest, perhaps. A good general definition is: "The art of preserving health; that is, of obtaining the most perfect action of body and mind during as long a period as is consistent with the laws of life. In other words, it aims at rendering growth more perfect, decay less rapid, life more vigorous, death more remote." In the largest sense it is the perfect culture of mind and body. We cannot dissociate the two. The intimate relations existing between them, and the condition of each so affecting the other, little progress can be made without harmony of action.

The individual may desire and strive to attain to the greatest perfection in hygienic conditions and surroundings, yet fail to do so by reason of the carelessness or ignorance of his neighbor. So a whole community may be placed under unfavorable hygienic conditions by the action of others. Pure water is necessary to health, yet a vault, cesspool, or slop drain not far away, may so contaminate the supply that disease and death result. Pure air is also a necessity, yet an individual cannot control the air he must take into his lungs. Other persons may poison his air, and thereby neutralize his best endeavors towards a better standard, and he be powerless to prevent it. General information and intelligent concerted action are necessary to proper conditions. The laws governing these are so many, and so subtle, that with the body politic constituted as it is, it is a matter of great doubt how near we may be able to reach the end we aim to accomplish. If favorable hygienic conditions were enforced, many would feel that personal rights were invaded, and the average American is very tender upon this subject. It may not be practicable to prevent the building and renting of tenements that are unfit for human beings to

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occupy, or in many other directions to force a better condition. We may hope to gradually change these relations by a more general knowledge of sanitary laws. The pressure of an intelligent public opinion has always been, and always will be, potent to correct in a great measure public evils, and while we may not reach that state of perfection desirable, we may hope to advance toward it.

In treating this subject one writer says: "In the scheme of Providence it may not be meant that man shall be healthy. Diseases of mind and of body may be the cross he has to bear; or it may be the evil against which he has to struggle, and whose shackles he is finally to unloose. The last disease will disappear, we may believe, only when man is perfect; and as in the presence of the Saviour all disease was healed, so before perfect virtue, sorrow and suffering shall fade away. Whether the world is ever to see such a consummation, no man can say; but as ages roll on, hope does in some measure grow. In the midst of all our weaknesses, and all our many errors, we are certainly gaining knowledge, and that knowledge tells us in no doubtful terms that the fate of man is in his own hands. It is undoubtedly true that we can, even now, literally choose between health or disease; not, perhaps, always individually, for the sins of our fathers may be visited upon us, or the customs of our life and the chains of our civilization and social customs may gall us, or even our fellow man may deny us health, or the knowledge which leads to health. But as a race man holds his own destiny, and can choose between good and evil; and as time unrolls the scheme of the world, it is not too much to hope that the choice will be for good."

The result of human efforts never attains to entire perfection, but the nearer we reach the desired end the greater the general good. Individuals, as such, cannot strictly follow rules of hygiene; but individuals make communities, and communities make nations, and nations can dictate the general rules leading up to an advanced civilization, and, therefore, to a greater degree of health, happiness and longevity. Inasmuch as the individual is powerless to prevent other persons from contaminating the air he must breathe, the

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water he must drink, or the food he must subsist upon, it is proper, and it becomes a duty, that national action be taken to control individual action. The lack of general information upon hygienic laws, from early civilization to the present century, has failed to produce effective organized action. Within a recent period of time, sanitary bodies, state medicine, etc., have contributed much in the way of health and information, and they seem to mark the beginning of a rapid, intelligent advancement.

The individual hardly realizes how great a place hygiene occupies in the several epochs of his life. Prof. Parkes divides it:

First. In relation to the natural conditions which surround him, and which are essential for life. Such as the air he breathes, the water he drinks; his food, the source of all bodily and mental acts; the soil which he moves on, and the sun which warms and lights him, etc.; in fact, in relation to nature at large.

Second. In his social and corporate relations, as a member of a community, with certain customs, trades, conditions of dwellings, clothing, etc., subjected to social and political influences, sexual relations, etc.

Third. In his capacity as an independent being, having within himself sources of action, in thoughts and feelings, desires, personal habits, all of which affect health and require self-regulation and control; and he then says, even now, incomplete as hygiene necessarily is, such a work would, if followed, almost change the face of the world.

The more one studies this subject the more he realizes its magnitude, and the great necessity for that amount of general knowledge with the public, which, if obtained, will surely eventuate in wise and effective measures looking to the decrease of suffering, and increase of happiness to the human race.

That we have advanced, both in mental and physical development, is proven by statistics and the history of the world, and the march is onward. If we turn to the history of the middle ages for evidences of advancement, we shall see the force of Prof. Bartholow's statement: "Pitiable, indeed, was the condition of the human race in those days of the world, when the conditions of health were

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either unknown or disregarded. There is no spectacle so sad and so terrible as the march of a great and fatal epidemic. That spectacle is even now rarely absent from the world, owing to the ignorance and cupidity of men; but the severest epidemics of the present century sink into insignificance when compared with the great epidemics of the middle ages. In the great Plague, for example, the vast numbers of the dead rendered the ordinary modes of interment impracticable. "The pope consecrated the Rhone, that the dead bodies might be disposed of without delay; and just outside the great cities, huge pits were dug, in which thousands of dead were thrown at a time. At Vienna there were six large pits containing many thousands; and in London it is narrated that one huge burying ground alone contained 50,000 corpses arranged in layers in huge pits."

If we follow this along, we find that these scourges permanently affected the development of the civilized nations. By the Black Death, Europe lost one-half its population, and in succeeding centuries cities, empires and armies were devastated by other epidemic diseases. One of the strongest proofs of the great benefit conferred, even with our present limited knowledge of hygienic laws, may be found in contrasting former centuries with the present one as to the ravages of Small-pox. A writer has said: "In Europe, as in other countries, Small-pox long constituted one of the greatest scourges of mankind. Not a decade passed in which the disease did not decimate the inhabitants in one country and another, or over great tracts of country, so that it came to be more dreaded than the plague." In a short time after it reached Mexico it destroyed three and a half millions, including the emperor. Even as late as the eighteenth century about one-twelfth of the deaths in Berlin, and one-tenth of those in England, were due to this disease. In France 30,000 died annually of this loathsome disease. The discovery of Jenner, with a better knowledge of hygiene, has so far destroyed its contagious power that it has but little terror for any people in the latter part of the nineteenth century.

As a further evidence of progress Dr. Bowditch says: "Intermittent fever has ceased in certain parts of Great Britain and in

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this country, under the influence of tillage and drainage of the soil. Private investigations in Europe and in America have in these latter days proved that a residence on a damp soil brings Consumption, and that drainage tends to lessen the ravages of that disease. Still more recently, cholera has been brought in its origin and progress under law, and we know how we could possibly prevent it if proper precautions against its origin were taken."

The census reports and other statistical information have demonstrated beyond a doubt, that, under a more perfect knowledge of the laws governing health, the average of human life has increased, and, contrary to the statements of crying philosophers, we know that the modern man is larger, stronger and more enduring in the various vocations of a busy life than his ancient prototype. And we also know, that, although still invaded by epidemics, the human race suffers much less than in former times. The world is comparatively free from those great pestilential waves, yet populations are denser, cities are larger, the older countries are becoming more and more overcrowded, and communication is more direct and rapid. Prof. Bartholow says: "The explanation is easy, and must be embarrassing to those pessimistic philosophers who find so much to condemn in our modern civilization. We owe our exemption from, or rather the diminution in severity of epidemics to the growth of our knowledge of disease and of the means of prevention. State or preventive medicine has risen into national importance. It would have been a great triumph if the bill creating a national health department, lately before congress, had become a law, for this would have placed us in advance of all other nations, except England, in a due recognition of state or preventive medicine. But our statesmen opposed it because of the bureaucratic dignity aimed at in the bill, and which could not be utilized as spoils. When epidemics are actually invading us, the machinery of a government bureau would be found very useful. It is a lamentable thing that our congressmen know so little of the matter as to fail to appreciate the importance of health to a nation, and of the pecuniary cost of epidemics."

Surgeon Billings, U. S. A., in a very able paper, says: "It is

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evident, therefore, that hygiene is not only a subject of scientific interest to the student or to medical men, but to the political economist and the legislator its problems and discoveries ought to be of great practical importance—greater, in fact, than many of the subjects with which those gentlemen usually occupy themselves; and at first sight it may seem strange that it should not receive more attention and consideration from politicians and legislative bodies than we actually find to be the case. A standing committee on public health would be about the last committee that either congress or a state legislature would think of organizing.

But when we examine the amount of knowledge as to the causes of disease which is actually possessed by the immense majority of fairly well educated and intelligent people, and see how much of it is mere vague conjecture, untested theory and baseless estimate, and, above all, how hopelessly unconscious they are of their own ignorance, and how promptly and confidently they will undertake to advise as to what should or should not be done to prevent Cholera or Yellow Fever, or any other disease whatever, we cannot wonder that the public at large is confused by the contradictory assertions made to it, and hesitates as to what should or what can be done in the matter.

There is a German proverb to the effect that "the better is often an enemy to the good," and this often applies to the action taken on propositions for improving the public health. The truly scientific sanitarian will promptly admit that his knowledge is scanty and defective; that he cannot assert that the measures he proposes are the best possible measures, but only that they are the best he can now devise; and that, in the present rapid progress in science and its application for the benefit of mankind, it may be that within a few years, at farthest, some better means may be found to produce the results desired; and these truthful admissions will often be used as arguments against his propositions and in favor of those of persons much more ignorant, but, by reason of that very ignorance, much more peremptory and assured in their assertions."

In a large degree our public necessity equals that of other nations; yet England is far in advance of us in the machinery necessary to a fair education of the public mind.

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In a lecture by Prof. Bartholow, he says, by way of contrast: "Far different has been the conduct of our English cousins. When that astute politician and wise ruler, Lord Beaconsfield, took office last, he signalized his entrance into power by making proclamation of the important place which health affairs should have in his administration, rightly recognizing the great influence which the national health and vigor has had in making England the very heart and centre of modern civilization. My Lord has been very busy in other weighty matters, and has not, therefore, paid the same attention he would have devoted to sanitary affairs; but they have not been neglected. England has an immense sanitary machinery — a medical officer of the Privy Council, a Registrar-General, a Health Board, and an officer of health for each sanitary district. * * * I am confident I do not exaggerate the importance of the subject, when I affirm that preventive or state medicine is the most necessary duty of a politician in this enlightened era. We are most lamentably behind the English, not only as respects governmental supervision and authority over all sanitary questions, but in the general knowledge of the subject possessed by the people."

If we turn from the humanitarian side of this subject, and view it from a merely mercenary or financial standpoint, we still confront the fact that hygienic knowledge is as necessary to the body politic as we find it to be from any other view. The eminent German scholar and philanthropist, Max Von Pettenkofer, said: "Mere chance will not explain the fact that, in the history of human civilization, it has always been unmistakably those nations that have shown the greatest care for the health of their citizens that have exercised the most useful and most powerful influence in the world." Rascher, in his celebrated work on the principles of national economy, states that the value of time is most fully appreciated among the civilized nations, as it is by the most intelligent individuals.

Passing by any consideration of the pain, suffering and sorrow caused by disease and death, and treating it only as a question of local or national economy, we find a large opportunity for amendment.

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Munich, a city of 180,000 inhabitants, an acknowledged center of science, was for a long time practically without sanitary laws. It well illustrates the consequences of a disregard for the conditions upon which public health depends, as well as the benefits resulting from sanitary reformation. Something of an idea of the situation there may be formed from the summary of a writer who briefly states that tenements were built, solid fronts of them, over common cellars; and the various compartments of these cellars were occupied by dealers as storage-rooms for as many kinds of organic substances. One contained green vegetables, another milk, another wood, another was a butcher's stall, another was the rendering place of a tallow chandler, and so on. The pernicious effluvia from all these permeated the crowded tenements above. Burial places were in near proximity to the population and water supply, and leased on ten-year payments, the leases being renewed every seventy years. Bodies were laid, one above another, in the same grave, and at regular intervals the bones of all were removed to a common pit, to make room for new occupants. It was estimated that fifty tons of refuse matter was annually deposited in the grounds proper of the city alone, to send hither and thither among the inhabitants poisonous exudations without hindrance by means of well-constructed sewers or shade trees. It need not be told that the people of this beautiful city were sickly, and that, too, from their own voluntary disregard for sanitary regulations. Munich became known the world over as the home of Typhus. More than two thousand people there had Typhus fever every year. In 1873, the Cholera swept away its inhabitants like a devastating flood. More than fifty per cent. of those born there died in infancy, and the annual death rate of the whole population was four per cent. Is it any wonder that out of Munich there should spring a leader in the great sanitary reform that has spread over the enlightened countries of the globe; or that the people, brought to a full realization of the consequences of neglecting sanitary provisions, were ready to engage in carrying out plans for improvement? Sewers were constructed, refuse and garbage were transported to safe distances, water was supplied that had not percolated

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burial places, and houses were modified to conform to hygienic principles. The result is, that now Munich ranks fairly among the healthy cities of the world. Her death rate has been reduced from four and two-tenths to three and three tenths, by which there is a saving of sixteen hundred lives annually; and by lessening the cost of sickness, the city saves more than two millions of dollars every year.

In a community of an average condition of health, and leaving out invalids, women and children, statistics prove that able-bodied men, between the ages of twenty and seventy years, will, on an average, lose seven days each year by sickness. If the average laboring man is sick seven days during the year, the loss as a producer will be at least fourteen dollars. In a community of ten thousand people, there should be about two thousand producers, and the loss would be twenty-eight thousand dollars. If we include the whole population, the average would be about twenty days to each individual, and the loss about one hundred and forty thousand dollars, and this exclusive of any estimate for necessary expenses incurred. With our present limited knowledge of the laws governing health and disease, it is estimated that at least one-half of this sickness may be prevented. If we carry our calculations on to cover the fifty millions of people in our own country, we will find that the loss assumes huge proportions; so large that it is well worth the attention of the political economist. The saving or increase of the productive capacity of the people, under a new order of things, would, even in one year, go a large way towards paying the expenses incurred in changing the essential things necessary to a better hygienic condition.

If we drop the sordid side of this question, and turn again to that which more particularly affects our hearths, homes and affections, there is found a greater incentive to a careful study and consideration of this subject. That we may do so intelligently, it is necessary to know, somewhat in detail, what we ought to learn, if we aim to reach a higher standard.

Dr. Fothergill, in a recent work on Maintenance of Health, has submitted a series of propositions that as nearly cover the ground

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in a popular way as any we have, and a portion of them are given below that we may better understand the necessity of more general information, and at the same time indicate more in detail some of the many things it is necessary to know.

For perfect health, or the nearest possible approach to it, not only is a sound body requisite, but a similar mental condition is indispensable. It is not sufficient that the body merely be kept in temperance, soberness and chastity, the mind must also be controlled and governed. Consuming passion and carking care affect the body, and mental anxiety stamps its impress upon the outward man. Inevitable burdens are borne with a sense of resignation which renders them tolerable, but when self-inflicted no such mitigating force is in action, and contrition and remorse bring but slight and uncertain relief. Cleanliness of mind is as important as cleanliness of body. The habits of thought are as subject to our choice as the fashion of our garments. Self-respect is incompatible with rags, and health is equally incompatible with moral beggary. The mind may be debauched while the frame is in its integrity, but ere long the effects will be apparent enough. The breaches of the moral laws are neither so apparent in themselves, nor in their consequences, as similar infringements of the physical laws; but this should not lead to the inference that the consequences do not follow, or can be evaded. Education increases the choice of occupations, and so exercises an influence over the health of man. Mere labor without thought tends to insanity; while exercise is essential to the health of those engaged in sedentary occupations. Fresh air and sobriety are important matters in relation to health, and position in life is not without its influence. Children who are chronically half-starved do not make healthy men and women. The diet suitable to one clime is inappropriate to another, and personal habits exercise a great effect on health. Genteel poverty leads to much ill health, while luxury, intemperance and indulgence produce bad results. All force is derived from food, especially from the respiratory foods, and the form of food consumed has an influence over the character of men and animals. Overwork is very destructive to the body,

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and when it is mental, not uncommonly overbalances the intellect. Overworked persons are apt to die from comparatively trivial diseases, because their resistive power or vital force is low.

The difference in the supply of oxygen is the probable reason that the agricultural population is usually hardier than people gathered in factories and workshops. The mental powers may be improved by persevering labor; but if this be excessive, deterioration results, which is very distinctly shown in the present race after riches. The plagues, and many of the epidemics of past times, were due to the insanitary arrangements of our ancestors. Sunlight and cheerful surroundings have an important bearing upon health. Pulmonary Consumption is associated with a damp subsoil, and its prevalence is affected by drainage. Rubbish foundations are fertile sources of disease, and drains, damp proof courses and dry areas are required for houses in damp situations. Porous, moisture-absorbing materials are unfitted for the construction of houses. The air supply of a house must be sufficient in order to secure the health of the inmates. Impurities of the air are often solid — fever poisons and vegetable odors consist of minute solid particles. Diminution of oxygen in the respired air, or excess of carbonic acid gas, are both deleterious. Poisonous emanations may arise from the earth, or be given off in manufactories, and by chemical agents used in certain crafts. In imperfect ventilation the normal proportion of the constituents of the atmosphere is disturbed; and to insure proper ventilation, not less than 1,200 cubic feet of air per head per hour are requisite for health, and yet more is required for the sick. The rate at which air passes through a room, or is renewed, is as important as the cubic feet of space allotted to each person; therefore the fires we use, and the different systems of ventilation in use, materially modify the situation.

Water becomes hard from the presence of lime, and bright and sparkling from the carbonic acid gas contained in it, and its quality is affected by the geological formations over which it flows, or from which it is derived. Water may be purified by boiling, distillation, subsidence and filtration; therefore family filters should be in every house. The purer water is the more powerfully it acts upon lead;

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therefore leaden pipes and cisterns are very objectionable. The waste-pipe of cisterns should never communicate with the drain without a break to admit of the escape of sewer-gas. The apt maxim, "the rainfall to the river and the sewage to the soil," is as applicable now as ever, and the disposition of sewage has an important bearing upon health. The presence of water adds to the offensiveness of decomposing matter. Where practicable, the removal of sewage by water is the easiest, cheapest and quickest. The position of a water closet in or about a house is more important than is commonly credited, and sewers should be water-tight and ventilated to permit the sewage gas from escaping at the water closets. Sewage in rivers pollutes them, and is injurious to those persons who live further down the river and drink the water. The proper disposition of sewage is to use it for agricultural purposes. It does not exercise a prejudicial effect upon the grass, or upon the animals fed upon it, or upon the human beings who eat them; neither is parasitic disease endangered thereby. Many, probably most, diseases are due to contamination of water and air. Malarial fevers arise from decaying vegetable matter and stagnant water. Enteric or Typhoid Fever is the result of insanitary arrangements, common in wet and dry seasons, and may arise without Typhoid Fever poison being present, but its presence makes infection almost certain. Dysentery and Diarrhœa are produced in like manner. The eruptive fevers are produced by infectious particles in the air. Epidemic disease is always most serious among those whose vital force is undermined by insanitary surroundings. Decay or decomposition is a process of oxidation — of atomic activity, and the particles of decomposing matter may be invisible to the strongest microscope, but are evident to the smell. Antiseptics unite with matter in a state of atomic activity, and bring it into a static condition, when it is harmless. These facts being known, it is of the greatest importance that disinfectants be used in the sick room in all atonic, low, contagious or infectious forms of disease. Poisoning may result from the use of pigments in confectionery, colored soaps, wall paper, or artificial flowers, or by the food we use. Putrefying meat causes disease, and putrescent food not only causes

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it directly, but more frequently undermines the constitution. Parasitic diseases are communicated by imperfectly cooked meat, and especially the flesh of the pig, either fresh or cured.

In some general remarks Dr. Fothergill says: "Man, as an animal, is chemically an oxidizing agent, reducing again to primitive forms the principles built up by the vegetable world, and taken in by him, either directly as vegetables, or indirectly in the shape of the material of other animals. Without vegetable life animals could not exist, and never could have existed; side by side they grow and flourish, indispensable to each other's existence; the tree breaking up the exhaled carbonic acid of the animal, the carbon being stored up in its increasing mass, while the oxygen is returned again, free and uncombined, to the atmosphere for the respiratory needs of the animal world. Round and round go the elementary bodies in ceaseless change of form, nevertheless never more than they were at first and will be at the last; the atomic material of this planetary sphere being ever absolutely the same in amount. The material of the bodies of Saul and his sons when burnt by the men of Israel after their ignominious exposure at Bethshan, in consequence of their defeat on Mount Gilboa, are circulating amongst us still; it served others before them, and has formed part of thousands since. It is quite within the bounds of chemical possibility, that some of the atoms contained in the fated apple of Eve may have lain in the material of the apple which revealed to Newton the law of gravitation; and that atoms of the knife, long mouldered into dust, with which Abraham threatened the life of Isaac, may be circulating in the blood of the Bedouin, aiding in bringing the free oxygen of the desert air to the tissues of the Arab rover. Shakespeare said: "To what base uses we may return, Horatio! Why may not imagination trace the noble dust of Alexander till he find it stopping a bunghole."

Finally, man is under the dominion of immutable natural laws. Impulse, temptation and ignorance are the great causes of man's violation of these laws. To meet the constant changes incident to growth, maturity and decay, material is taken in, in the form of air, food and drink, which is constantly appropriated and assimilated,

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and so nutrition and repair are conducted. Outside of these, mental and moral influences, and the law of hereditary entailment, personal habits, and various surroundings, go to make up the sum of hygienic conditions. General and special education are desirable for all, as cultivation alike affects mind and body; action of a part leads to greater development of it; disease tends to a less perfect condition, and there is every reason to believe that man's happiness, as well as health, will be increased by the growth of knowledge, and particularly so if acquired in the direction of the subject under consideration.

From the foregoing suggestions, some imperfect idea may be gathered of the necessity for a more extended public education touching the question of hygienic knowledge.

In America the common school system is being brought to such a degree of perfection, and has become so generally adopted, that we must depend upon this as the surest and most effective means to a practical and permanent public education. It is unfortunate that no writer or scholar has yet given us a text book upon the subject of hygiene fully adapted to common school use. Even the present imperfect knowledge of hygiene indicates that it must rapidly develop into a science that more nearly and universally affects the human race in its wealth and happiness than any other. Our public educators should insist that it be made a part of our system of common school education. That system is already crowded, and its subjects groan as they stagger under the burden inflicted. It would hardly be human to add to this. The question presents itself to the practical mind, would it not prove a great public benefit to make hygiene a part of this system, even to the exclusion of Greek and Latin conjugations, which may be useful as a means of mental discipline, and appropriate in a classical course, but are not necessary to the curriculum of an education for the practical duties of life that is contemplated by our system of common schools?

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RECREATION AS A SANITARY AGENT.

BY REV. J. W. HAGEMAN, OF WAUSAU.

Man finds in outward nature disturbing elements, typical of kindred elements within himself; but in a perfect state he is assured that none of these shall exist; that storms and similar convulsions of nature, violent changes of temperature, regions cursed with sterility, swamps and malarious districts shall all be done away; and he has learned that this is to be finally accomplished by his agency; that he is slowly to reclaim the earth by a strict obedience to those sanitary laws that are written upon his own nature, and founded upon his relations to surrounding conditions. From physical sins committed by man come in many cases the influences that cause disease; and he who would successfully combat evil natural conditions must guard himself against such sins, whether they spring from ignorance or are committed against the light.

Healthfulness and holiness are correlatives; so are filth and sin. Water loaded with the filth absorbed in percolating through a foul soil, through grave yards, stable yards, cess-pools, outhouse vaults, unclean dooryards, food that is tainted, fruits green or past a fitting stage of ripeness, milk that has absorbed the poison of unclean dairies or of rooms where patients lie sick of fevers, unsunned and unaired living rooms and bed rooms, cellars undrained and uncleansed from year to year, with layer upon layer of decomposed and decomposing vegetable matter covering the floor, and barrels of unmentionable abominations stowed away in dark corners, sending out their pestiferous vapors to poison the air of the house, irregularities in eating, drinking and sleeping, lack of proper and wholesome exercise, neglect of cheerful and invigorating amusement,—the whole round of sins which spread sickness over the earth and

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tend to the generation of a feeble and diseased posterity, these are the dragons that we have to fight with, these the enemies which we must overcome, before society can make any substantial progress toward perfection.

It must be acknowledged that the science of preventing disease, the art which will ultimately push a very large part of physical evil out of existence, save the time both of patients and nurses and the money paid for medicines and the services of physicians, and spare the suffering from pain and the inconvenience resulting from sickness to the sound members of the household, this precious knowledge is as yet only in its infancy and is far from receiving the attention which that tender stage of existence demands. It is even to be feared that it is being purposely neglected. Our American method of living is to work under the highest possible pressure and take the chances of utterly breaking down. We are willing to spend almost any amount in curing disease, but, ignoring wholly the conditions under which disease inevitably originates, the means by which it is developed and spread broadcast through a community, we are very loth to be at even the smallest expense or go to any trouble for the purpose of preventing it. We need less hurry and whirl, and more true progress. We find that by far the larger part of the inmates of our insane asylums come from those classes who plod on from year to year, ignoring the laws of the body and denying the demands of the mind for rest, change, recreation. These think that a few hours sleep at night is all-sufficient as a restorative for the body, jaded and worn out by years of monotonous toil; and when at last the truth becomes too plain to escape even their perceptions, they resort to excitants, spur up their flagging energies of muscle, by stimulants and narcotics to act upon the nerves, and with the aid of these poor crutches they limp and stagger along for yet awhile longer, and at last break down and die miserably. Our physical stamina is weakening under the vicious system of forcing work by the aid of stimulants and soothing agents, and its effects through heredity. The laws of sanitary science demand that man shall so order himself in relation to his health conditions as to secure for the benefit of society, as well

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Recreation as a Sanitary Agent.

as of himself, a sound mind in a healthy body; and one of the most agreeable, as well as one of the most necessary agents in doing this, is found in recreation; the true meaning of which is, that which re-creates. It is based upon a recognition of the law of the decay of the chemical compounds which, in unstable adjustment, form the body, the removal of useless or worn-out cells and atoms, and the repairing of the waste. The life-processes are beyond our control; and all that we can do is to make clear the way for the funerals of the dead particles and place new material within the reach of the little life-weavers within us, to be spun out by them and converted into brain, bone and brawn. We can, and we must if we would attain anything like physical perfection, so dispose of ourselves, so arrange our time, as to give them chance and opportunity to repair the waste, build up again the broken-down tissues. Though they work fast, we can tear down faster than they can build up, and they must have fair play and must not be over-hurried if they are to build well and strongly; if this be denied them, the result will be a broken-down constitution for the man or woman who treats them thus unjustly. Recreation, then, may be defined as the art of so disposing one's self that the whole organism, body and mind alike, may be kept strong and in perfect working order, and that all the resources of the individual may be completely under control, always ready for prompt and efficient service, able to respond to extra calls should it be necessary.

The economy of nature and society gives us three recreating agencies: sleep, which affords an opportunity for the upbuilding of the muscular and nervous tissues; the rest of the Sabbath, which allows space for the taking up of any loose ends, for the more complete finishing of whatever was left undone during the nightly rest of the week, and which brings into activity and aids to develop those forces of human life which find but little opportunity for exercise during the hurry and bustle of the business of the remaining days of the week; and the instinct of play, which involves change complete and entire, and the loosening of all strain. These three are the means of re-creation for the human organism; and, properly employed each in its due season, these will prevent much

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of physical and mental disease. These are the means of recreation for the worker; to him who wastes his powers by not using them, who is toned up by no praiseworthy and noble ambition, it would be a true recreation to gain a definite aim in life, an object that shall compel him to use all his latent energies.

To the young men who dawdle through the streets and avenues of some of our cities, it would be recreation to exchange the cane for the surveyor's rod, the lazy, careless stroll through the city thoroughfares for the purposeful tramp through the woods and over the hills in making the highways over which commerce and civilization shall presently pass. And many a young woman who lounges in the parlor and trifles with her "accomplishments," would find true recreation and learn the repose of living for a purpose while studying the lines of beauty, in cutting and fitting garments for some needy child, in the modeling of a well proportioned loaf, in investigating the laws of chemistry as applied to cooking, in the selection of food suitable to different constitutions and the varying temperature of the seasons, or in the applications of hygienic laws to home life. The idler, the pleasure-seeker, he who finds every surrounding a bore, must find recreation in pursuits which will not pall, which will stir up the dull brain, and give the satisfaction and pleasure always attendant upon useful employment; such, in a word, must find recreation in ways diametrically opposite to those which will give rest and refreshment to people whose brain and muscular tissues are constantly worn out by hard work.

The more commonly recognized sphere of recreation is for the overworked and for those who need a relief from wearing occupations. Whatever its form it must be something which shall be congenial to the individual, and which demands but little strain and waste — at least in the same direction with our ordinary every-day pursuits. It should be such as will bring body and mind alike up to a good working pitch, strengthen both, and increase instead of diminish their resources. If the usual business of the individual be of a character to wear out the muscles, his recreation should be such as will allow of their renewal; if the nervous system be that most drawn upon, sleep may be the best form of recreation. The

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paths which have been worn and worn out by repeated traversing must be exchanged for new ones; the old ruts and grooves must be abandoned for the time at least, and fresh channels must be formed. And yet care must be taken lest the change be so great as to work harm rather than benefit; it should be sufficient to turn the thoughts away from the wearing cares, but not so radical as to cause anxiety and worry. Too complete an alteration may be as bad as, or even worse, than none at all.

It is no true recreation to exchange a clean bed, a well ventilated and airy bed-room and good sanitary surroundings for a dirty couch, with feather-beds over and under one, in a filthy hut; nor, as the writer can testify, is it entirely a recreative process for one leading the ordinary daily life of a student to pole a heavy and clumsy log canoe up a rapid stream, to lift it by main strength over dams, and, at the end of a day spent in these pleasing labors, to have sleep broken, or rather wholly prevented, by clouds of hungry mosquitoes, or to waken feeling chilled, and find that one has been lying in a puddle, caused by a shower, through which he has slept from sheer exhaustion.

Had a tent, pitched upon the high bank of some swiftly-running forest stream, been substituted for the pioneer's cabin, with a bed of hemlock boughs and pine needles instead of feathers in the one case, or had the pleasant and congenial party in the other floated leisurely down some beautiful river in a roomy skiff, instead of the cramped and cramping dug-out, enjoying the scenery, admiring the wonderful rock-sculpture accomplished by the waters and the winds through the course of the centuries, and camping at night at whatever time and place seemed desirable or offered any special inducement to linger, and bringing their excursion to an end as soon as the first charm of novelty had gone, and before the necessary labors became distasteful, they would have reaped a benefit which was lost to a great extent in the fatigue and broken rest which were the concomitants of their actual journey.

Seasons, places, conditions should be studied in taking recreation, and regard should be had, moreover, to one's temperament, usual profession, the state of one's health and the degree of strength

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of which one is possessed. With attention to these there can be no doubt of the benefits that will accrue, the recuperation both of body and mind that will be the result of proper recreation. Physical forces have a limit; the bodily tissues can endure only up to a certain point, beyond which even the lifting of a feather or thinking the lightest thought that can stir the brain-cells may be too much.

Weaken the nervous system by whatsoever means we may, whether by over-work or over-worship, whether by asceticism or prodigality in pursuing virtue or vice, following wisdom or folly, it matters not how, and we become nuisances to ourselves and to others. Then, as the dyspeptic is conscious of his stomach, do we become aware that we have a nervous system; thought is dulled and ideas are cloudy; sympathy awakens no gratitude, draws no response but querulous groanings. Children are banished with the petulant command "Don't bother me!" Too often in this miserable state the first gap is formed between the heart of the child and its mother; the thin edge of the wedge is introduced which is finally to force them apart forever, to render any confidence between them an impossible thing. It is within the experience of only too many how shattered nerves ruin home-life, disturb the peace of the family and put happiness far away. The writer knows of fellow students who, in their desire for excellence and knowledge, would pore over their books, neglecting proper exercise, failing even to take the sleep that was actually necessary, and, as might readily have been foreseen, broke down early and died or became insane. Because we can stand hard work we are apt to forget that there is a limit of resistance in every case, and to ignore the causes which inevitably produce their effects without regard to persons.

We know that hard work must be done in order to achieve success, and that the greatest names of history represent the hardest toil. Virgil spending twelve years on his Æneid, Thucydides twenty years on his history, Lucretius a life-time on his great poem; these are illustrations of the law of labor in relation to success. But in our modern life of elbowing and pushing to get bread, thousands seem to be rushing tired through life, to die wearied out

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for the lack of recreation. Should they take time for it, they say that the many waiting for a chance would rush in and fill their places so that they would be crowded out and lost. This seems like committing slow suicide to keep off death. All workers need recreation for each day, each week, each year. Too often the alleged lack of opportunity is really only fear of Mrs. Grundy, who says that play is undignified and unbecoming for men and women. So much afraid are we seemingly of her sneer, her pointing finger, shrugging shoulder and sarcastic tongue, that we prefer to do almost anything rather than encounter them; hence we choose physic in place of exercise — poisonous drugs instead of health-giving sports. Mrs. Grundy has amusements of her own, it is true, but they are too often wearing, not recuperating.

But we are at last recognizing that the play element is a desirable, even a necessary feature of healthful social life, and are beginning to make room for it to some extent by admitting holidays into our calendar, as older and, in some respects, wiser nations have done before us.

In choosing a recreation after the toil and labor of the day are over, regard should be had to the character of that labor; the brain worker should engage in some pastime that will exercise his muscular system, and this should not be carried so far as to bring on overfatigue and nervous exhaustion, but should be sufficient to give sound sleep, and brace up the whole man for the work of the morrow. Such a toiler should go out into the sunshine when practicable and inhale the out-door oxygen in all kinds of weather. A walk, a gallop on horseback, a rush on the bicycle, a row on lake or river, a tramp with his gun through the woods, sparring, fencing, archery, some one or more of all these is within the reach of every man, and all of them, if not carried to excess or abused, will constitute recreation which will rebuild the worn down tissues. For those who are less vigorous, a stroll, a drive, a sail or game of croquet is available. All exercises however which aim at competition tend to cause over-exhaustion and over-excitement and are barred out by the very design of recreation. Big muscles are often gained at the expense of the constitutional powers, as are closely

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packed minds at the price of losing all true and symmetrical development.

There is scarcely one among the many great and good men who are the objects of the world's admiration, and with whose names the words amusement and relaxation seem almost incongruous, who has not had some special favorite method of recreation. Bryant with his dumb bells, Gladstone swinging his axe, Bancroft riding through the avenues of Washington, Walter Scott with his dogs, Walton, Herbert, Bright and Paley with their fishing rods, Bushnell, Shelley, Goldsmith and Macaulay romping with children, Innocent III. playing ninepins, Addison, Bacon, Buffon and Cowley walking, Milton at the organ, and many more might be named as types of these.

For winter sports there are skating, ice boating, snow balling and the like, and if one wishes for more exciting and exhilarating sport, let him try the "toboggin;" as he scuds down the hill upon it he will make acquaintance with all its inequalities in far more intimate fashion than upon any sled with runners, although that may afford recreation well worth having. Any dignity that may be lost in these occupations can well be spared; it is not of the genuine kind and not worth having.

Besides the daily release from ordinary work which may not be sufficient in the aggregate to re-create thoroughly, and in all respects we have, by a law necessary for the well-being of society, one seventh of the week set apart in which we are forbidden to labor or cause others to labor for us. The capitalist should be made to understand that this time belongs absolutely to the workman, and that he is robbing his employes when he induces or compels them to labor during these recurring periods of rest. It is directly in opposition to the design of this day of recreation for those whom it is intended to benefit to employ it in excursions upon crowded cars and steamers, and in practices that weary instead of resting. Sanitary science here demands that those parts of the brain which during the remainder of the week lie disused shall be brought into exercise that they may not become paralyzed and lethargic, and at last die from pure inanition. On this day of recreation he should

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strive to bring himself into harmony with his highest temporal and eternal environments, that the resulting peace and happiness may secure the best reaction of mind upon body. Physicians know how some secret care, some gnawing anxiety, preying upon the mind of a patient, will baffle the skill of any other than the Great Physician.

But besides the daily and weekly periods of rest, men need once in each year for perfect recreation an entire change of air, of scene and surroundings, of habits and modes of life. They should have a season during which all cares of home and business can be thrown aside; the office, the shop, the books and the tools become as completely ignored and cast away as though they were annihilated. An excellent means of doing this is to make a tour on horseback, taking care of one's own horse on the way.

Tramping over mountain regions (not tramping in the ordinary acceptation of that term, of some results whereof the writer has has some small experience), canoeing, yachting, hunting, fishing, geologizing, botanizing and similar excursions, more or less prolonged, offer many avenues of recreation. If one be in feeble or delicate health it will be wise, before starting out, to consult the family physician, and to be guided by his advice in selecting a mode of recreation. As a general rule, a purpose should be assigned as the object of every tour of recreation, which purpose should not be such as will centre the attention on one's self, unless the previous ordinary occupation has been such as to cause self-acquaintance and self-development to be neglected, and then the best results will be attained by having such a purpose as will draw self out and set it in a light where one may see it as it really is.

Camping-out is among the best and most agreeable of recreative agents. For this purpose places free from malarious influences should be selected; those living among the forests and mountains should, if practicable, go to the sea-shore; those who are enervated by the heat should seek cool localities. The tired and worn should avoid the excitements and restraints of fashionable life at popular resorts, as, also, on the other hand, should they beware of the wearying effects of solitude without congenial company. Our evolution from the earliest stages of civilization up to our present

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standing has not destroyed all the instincts of savage life, and a partial return thereto at times, and for a brief period, has a decidedly beneficial effect. It is a good thing to cook our own food, to wear old clothes and the minimum of them, to dwell in tents, to hunt and fish, to yell and shout, to yawn, stretch and lounge as the fancy seizes us.

In camping-out, take your time, do not hurry, do not fuss, take everything as it comes and laugh at disagreeable accidents should they happen; have companions who are limber enough to be jolly, take along with you a supply of good novels for a rainy day, should one occur, and a handful of nonsense, wear woolen underclothing at night, and don't forget plenty of blankets. Use water from a spring or lake; should you depend on a running stream for a supply, explore it far enough to satisfy yourself that its waters are not polluted by any dead and decaying matter. Choose high and somewhat sloping ground on which to pitch your tents, and, whether you propose making your stay long or short, take time enough to render your temporary habitation safe and comfortable. The writer's experience has been, that, with an abundance of heavy flannels and blankets, camping-out, even in winter with the thermometer below zero, may be a preventive of disease and a valuable means of recuperation.

For those who cannot take such trips, recreation may be found nearer home. Even a change of the ordinary habits and ways of life may sometimes be a true recreation, by giving a chance for rest and thus preventing a degree of fatigue which renders the system more liable to the attacks of disease. For many an over-worked woman, in more remote farm-houses especially, it would be a recreation to be relieved from the necessity of cooking a hearty meal three times a day — particularly in the heat of summer; could the cooking for the whole day be done, occasionally at least, in the cool of the early morning, and the need of standing over a hot stove at noon-day be thus obviated, would not many wives be glad of the relief? And, if by this change there could be brought about some improvement upon the diet only too often found upon the farmer's table of salt-pork fried to a crisp, "fried cakes" and

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the whole list of kindred abominations, would not the benefits extend far beyond " the women folks?"

A form of sanitary recreation to which some attention has lately been called, more especially in the Eastern States, is well worthy of imitation elsewhere. Those having farms and pleasant country homes have taken neglected children and broken-down workers in the great cities out into the country for a season, thus giving them the benefit of pure air, wholesome food and thorough change.

Fortunately the Creator has so firmly and deeply implanted the instinct of play in the nature of children, that the large majority of them do obtain a fair measure of health-giving recreation, and as they will in their plays imitate the employments in which they see their elders engaged, it is all-important that they should have the advantage of correct principles. So from mere matters of pastime and amusement, while breathing in pure air and getting the benefit of muscular exercise, they may gain much that will be useful to them in after life. In many of their games they might master to a great extent the philosophy which underlies much of the serious business of the world, and by so doing, diminish greatly the necessity for the high pressure under which education is at present too often conducted. Children need recreation of a different kind from adults. The interests of some pursuits and the novelty of change bring into play a certain kind of unconscious exertion, muscular or mental, which has a very different effect from that of forced labor.

To sum up all that we have to say, recreation is a necessity for all, for young and old, men and women, robust and feeble, ignorant and learned. To produce its full and its best effects recreation must however be suited to the individual. A week or two of camp life, which would be a novelty and a relief to the over-worked professional man, would be of little or no service to the lumberman whose associations with the woods are those of hard work. By properly selecting the methods of recreation, the nervous system is built up and invigorated, the digestive powers are strengthened, and the lungs being supplied with purer air, the blood is more thoroughly oxygenated and carries more vigorous life to

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all portions of the system. Let us then have it at proper times and in full measure. In the name of health and happiness, because of the resulting vigor of body and cheerfulness of disposition, because recreation in itself is a powerful sanitary agent, preventing many disorders of both body and mind, because soundness of body is on the direct road to holiness and purity, we plead for more recreation of all true and genuine kinds, for more laughter and less frivolity, for more joyous romping with the children, for more living near to nature, among the mountains, in the woods, by the lakes, rivers and sea-shore, for more frequent Sabbaths of rest and worship.

Let our strained and straining American lives hear and obey the voice saying "Come ye apart and rest," and let us recognize through the benefits of obedience and recreation that it is really and truly the voice of God in man, the voice of Him who calls to all the weary and the heavy laden, saying "Come unto me and I will give you REST.

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SCHOOL HYGIENE,

AND WHAT THE TEACHER CAN DO TO PROMOTE IT.

BY PROF. THOS. W. CHITTENDEN, OF APPLETON.

In former papers we have endeavored to sketch some of the requirements of an ideal school-house, so far as the health of its inmates is concerned, and have considered the defects only too often to be found in our school buildings as they exist to-day. In the present article we propose to discuss the means of counteracting in a measure some of these defects, i. e., the means which lie within reach of the teacher, some of the duties of the teacher in regard to the health of his pupils, whatever may be the character of the building under his control, some of the errors into which teachers occasionally fall in the management of the children committed to their care, and some of the injurious physical consequences resulting therefrom.

It is probably true that scarcely a single school-house exists in Wisconsin which is anything better than an approximation, more or less remote, to the perfect ideal of the advanced sanitarian, and Wisconsin is by no means the only state of the Union of which this may be said; nor is there probably a school-house where injury to a greater or less extent does not accrue to the health of its occupants; it is also true that the sum of this injury, which might be greatly lessened is, in some cases at least, greatly increased by the injudicious rules adopted for the government of the whole, or the unwise course pursued by the teacher in the case of individual pupils. We grant at once and willingly that no teacher whom we have ever known would do aught knowingly that could occasion permanent or temporary harm to a child, that in all cases where

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harm is done it is done ignorantly; but we know that injury is too often caused during school life; we have sad suspicions that we ourselves have been the source thereof, verily thinking the while that we were doing good work and rendering good service, and we know that unconsciousness of the fact that harm has been done does not make that harm any the less real or prevent in any way its evil consequences.

Among the injudicious proceeding of the school room is the practice — not now perhaps as frequent as it was in former years, but still too often seen — of requiring the maintenance by a class or by all the occupants of a school room of a certain uniform position during comparatively prolonged periods of time. We do not allude to the barbarities of this kind sometimes even now practiced by way of punishment, but to measures of so-called discipline and training. For example, we have seen a large class of growing boys, some strong and vigorous, others the reverse, required to maintain "a military attitude" during an exercise sometimes extending through two hours' time, and never completed in less than one hour, which was called a review, in which the progress and conduct of each individual during the preceding week or term was made the subject of public discussion and comment. "My object is to harden them," said one who pursued this injudicious course, the cost at which such "hardening" was accomplished being wholly ignored.

Again we have seen instructors who require their pupils to stand erect and motionless during the whole time of a recitation, with books accurately inclined at a given angle, every disengaged hand so held that the index finger thereof shall point to a specified line upon the floor, and with every great toe aligned upon a certain crack, such stiff and wooden position to be maintained without variation until the close of the lesson, and great is the pride of the teacher and the admiration of superficial observers when a class is brought to so "high a state of discipline." Such instructors might profitably read some standard work on military drill, and thereafter take lessons from a skillful drill sergeant in his management of a squad of recruits. They would find in the treatise that even in the way in which a man stands allowance must be made for indi-

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vidual peculiarities of build and conformation, and that, as no two men are cast in exactly similar moulds, so no two can take exactly similar positions in all respects; going into the drill-yard, they would observe the sergeant careful constantly to vary his exercises, in order to avoid weariness, and would also remark the frequency with which the recruits are allowed to rest. A very sensible writer has said upon this point: "When children are forced to remain standing, and to keep, as best they may, a fixed position for any length of time, they are sure to yield to some distorted action which soon becomes habitual, and not only destroys all grace of carriage but injures health as well. Strive as they may, even under the fear of punishment, there is not a limb which will not make good its natural claim to liberty by one motion or another. Set attitudes, if maintained for any length of time, are sure to degenerate into awkward habits if not into actual permanent deformity. No amount of training can ever give back to a child who has long been deprived of freedom of muscular movement the unconscious ease and grace seen in one who has always enjoyed such liberty." So far from being compelled to remain in one unvarying position for any considerable length of time, growing youth and children should be encouraged — even required to change the bodily posture as often as there is any sense of weariness or fatigue.

Whatever little justification for the practice of compelling a standing position during the whole of a recitation, may be found in the case of boys, there can be none at all where girls are concerned, and this is especially true in the case of girls of fourteen years of age and upwards. Strange as it may appear, we have observed, and our observations have been confirmed by that of others, that female teachers are often worse offenders in this respect than are those of the other sex. It would seem that having the benefit of their own experience, the knowledge of their own physical needs that they must necessarily have acquired, they would act more kindly and more wisely as regards pupils of their own sex at least. But we have visited school rooms where, with comfortable recitation seats provided, classes composed in very large proportion of

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girls from fifteen to eighteen years old, were obliged to remain standing during a prolonged examination, and this in one instance in which a lady was in charge whose health had suffered greatly from precisely this cause!

But it is not only during recitations that the error of requiring this wooden fixedness of position is committed; it is true that we do not now often see the school-room in what was commonly supposed to be the "perfect order" of our own younger days, but there are yet teachers who forget or have not yet learned that true order and solid advancement in knowledge are quite consistent with easy and unconstrained positions of body, and that the fact that every hand is carefully tucked away out of sight and every eye riveted on the book is no guarantee that the thoughts are not wandering; that the child in imagination is not far away. Teachers of writing are perhaps especially prone to insist upon an exact and rigid uniformity of posture, losing sight of the fact that hands differ in conformation, and that no two persons left to themselves will grasp a pen or pencil in exactly the same way. Just here we may mention that the best and most successful teacher of penmanship we have ever met had no uniform rule for holding the pen; his method was to cause a pupil to sit erect with the right hand hanging freely by the side, the fingers taking the position into which the various muscles drew them; he would then place a penholder lightly across the thumb and direct the scholar to close the index and middle fingers upon it just closely enough to prevent it from falling to the floor. The position assumed in doing this he held to be the easiest and most natural, and therefore the best for the individual. In his classes at the close of a lesson, we never saw the pen thrown down in evident weariness, or the stretching and rubbing of the strained muscles that we have often seen under other systems, and we note the plan here because we have never seen it practiced or mentioned elsewhere.

Prolonged sitting at desks or tables which, whether from undue height or from improper relations of any kind between themselves and the seats, compel a constrained position of the head; the thoracic and abdominal cavities and the viscera therein contained,

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can scarcely fail to be the cause of evil the extent of which it would be hard to estimate. Great as is the improvement that has been made in school-furniture within the past few years, and no one will deny that it has been very decided in all respects, with a single exception to be presently mentioned, much even of the best has serious defects, one of which may be demonstrated by a very simple experiment. Let a child be placed upon a modern school seat adapted to his size, his feet resting firmly on the floor and the body erect; examination by the hand will now show an almost entire want of any correlation between the curves of the spine and those of the back of the seat by which the spine is to be supported, and if the child be divested of his clothing, this lack of correlation will become too plainly visible to be overlooked. In some cases the two sets of curves recede from each other where they should approach most nearly. One feature of nearly all the desks and seats now made is very far from being an improvement, and must be condemned by all sanitarians, yet strangely enough we do not remember that attention has ever yet been called to it. We refer to the practice of uniting seat and desk so that the seat of one pupil forms a part of the desk behind him; there can be no justification whatever, upon sanitary grounds, of this union, the only object of which is to save space and which thereby leads to all the evils of over-crowding. In fact we have observed that this idea of economy of room is a leading one with several prominent manufacturers, and that too many devices by far have had this object in view rather than the physical welfare and comfort of the children who have been supposed to profit by them.

Perfect school desks and seats have not yet been made, great as is the advance in their patterns within the past twenty-five years, and some even of those who have made a special study of them from a sanitary point of view, have put forward some notions that seem to be founded on theoretical conceptions of what a child should be physically, rather than on actual measurements of actual children. Thus, in one paper with which we have recently met, the depth of seat from front to rear is set down at ten inches for children from nine to twelve years old. Placing a well-grown boy,

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between five and six years of age, upon a chair, we measured carefully the depth of the space actually covered by his body, and found it to be exactly twelve inches; the perpendicular distance from the floor to the under side of the thigh, the feet resting flatly on the floor, was thirteen inches; hence a seat that this child could occupy with comfort would be not less than eleven inches deep from front to rear, and not more than twelve inches in height at the front edges. In a little work on School Hygiene, recently published, is given a table in which may be found a list of the proportionate heights of seats and desks, based on the height of children of different statures, the extremes being thirty-eight and one-half and sixty-eight and nine-tenths inches. We have not verified the correctness of the table by measurements of our own, but we judge the height of the seats there set down to be too great while the depth is not sufficient. However this may be, the principle upon which the table in question is constructed is the only correct one. Instead of the school-room being furnished with seats and desks all alike in height there should be not less than five different sizes in each room, and eight would be still better. The desk should be so high that its front edge, i. e., the edge next the pupil, shall be just on a level with the elbow of the child as he sits erect in front of it, and desk and seat should be so placed with reference to each other that a plumb line let fall from the edge of the desk shall just strike the edge of the seat or fall not more than an inch back thereof. Should it be needful for the student to stand up in his place for recitation or other purposes, the desk may be arranged to be turned down, as is now done by several manufacturers of school furniture, but we are by no means advocates for this plan, believing that such ample floor space should be allotted to each pupil that no difficulty can arise on this score. The allowance heretofore recommended, of twenty square feet per capita, will suffice, and this should be the minimum allotment in all grades higher than the primary; and we may say here, moreover, that such an allowance will prove one of the most powerful means of maintaining order and cleanliness in the school-room. By assigning to each child a definite territory, marked off by boundary lines drawn upon

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the floor, giving him full control over it and making him responsible for its condition at all times, much will be done in forwarding his practical education, while the distance interposed between him and his neighbors will tend greatly to diminish that bane of many instructors known as "communicating."

It may be said that such changes as those just indicated lie rather within the province of school committees and boards of education than of teachers, and that they are not to be looked for until the men who compose such boards and committees are selected upon principles somewhat different from those which prevail at present. This is true in part only; the teachers are the real power behind the throne in this case, and their influence in these times is far greater than very many of themselves know or even suspect; when *they* have fully determined that changes even more radical than any sketched herein are necessary, it will not be long before they are made. "No American community ever refused adequate support to an energetic school board," and school boards generally look to the teachers to tell them what is wanted. Let the teachers "ask in faith, nothing doubting," and let them also, as they can easily do, back their demands with known and proven, but too generally concealed and neglected facts and figures; let them once gain the attention of the public for these, and the school board that will refuse their reasonable demands will be hard to find.

Even now, however, the teacher can do much toward preventing the evil results which may readily follow upon prolonged occupancy of seats as usually arranged, by so constructing his plan of study and recitation, and all the exercises of the school-room, as to permit and require frequent changes of position, as also by instructing his pupils in, and by illustrating in his own person those positions of the body which conduce to health, comfort and grace; if by some rare chance he should have a suffcient superficial area appropriated to each pupil, a brief time might advantageously be given to calisthenic exercises as often as once an hour.

And just here we may say that in speaking of calisthenics, we do not mean the exercises well described in the following extract taken from the "Sanitarian," an excellent monthly publication devoted to matters of public health:

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School Hygiene.

"Six hundred children simultaneously stamped the right foot and scraped the left foot along the floor; the same number turned their heads to the right three times and to the left three times; they stood on one foot, and then they stood on the other; they beat their little chests with a force that would not have injured their own health or that of a mosquito; they tipped forward until the bottoms of their spines became prominent; they tipped backward until some of them lost their balance, and had their names set down in a little book as candidates for an additional exercise, calculated to increase the flow of blood to the surface, when the company should have gone, and finally all folded their arms and sat down, the same corpse-like gayety having been preserved at the beginning, middle and end of the exercise which was supposed to give them health and vigor enough to last until the same hour next day."

Such performances are worse than useless; the dead, mechanical uniformity of the drill from day to day, the utter lack of any interest on the part of pupils or teachers, the feeling on one side that they are silly and an enormous bore, and on the other that they are utterly valueless, all these tend to take from the so-called exercises even the small modicum of virtue which in the beginning they might have had, and from which, in judicious hands, something of real physical benefit might have been developed.

The system of gymnastic games introduced some twenty years ago by Dr. Lewis was a movement in the right direction; the scheme as a whole was not well adapted to the school-room, but a judicious combination of some of its features, with selections from the schemes of Ling (which has been used successfully in Swedish schools for many years), D'Alfonce and others might be wrought into a wholly unexceptionable system of school gymnastics, one which, properly carried out, could not fail to bring about a vast improvement in the physical health of the children in our public schools.

Forty-five minutes is the longest time that should be devoted to the recitation of any lesson by the most advanced students in our high schools; thirty minutes is preferable as a limit for the higher classes, while the middle grades should have no lesson assigned

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that cannot be recited in twenty minutes, and the primary pupils should have a change of some kind once in fifteen minutes at most. When a class has become intensely interested in a subject — and we have had the good fortune to see many classes in that excellent condition,— the temptation to the teacher is very great to continue a little while longer; this point, however, when attained, is exactly that at which a lesson should be stopped for the time being,[1] and after a brief space given to some lively physical exercise, a new subject of study may be taken up, to be dropped in the same way at the proper time; four hours daily passed in this manner in the school room would advance the education of children far more rapidly than six hours daily, spent under the conditions which too often exist at present, while the advantages accruing to the physical condition at the same time would be by no means few or small.

The supervision of the sports and games of the play-ground as well as the more systematic exercises that may be introduced, should not be neglected by the teacher who has the sanitary welfare of his pupils at heart. We know only too well that the teacher, especially if he have a large school under his care, is obliged to occupy the time of recess by making up his records, or marking exercises, recitations, etc.; but we believe that in many instances a large amount of this kind of work may be profitably neglected. In the course of our own personal experience as a teacher, we have seen not a few broken limbs, as well as other and more serious casualties, every one of which might and probably would have been avoided had a teacher been present to oversee the games and plays in the course of which they occurred. Among these casualties have been several instances of hernia, and we are convinced that very few among the teachers of Wisconsin are aware of the ease with which this distressing and dangerous injury may

[1] Mr. Samuel Weller's theory of the art of letter-writing, as recorded in the Pickwick Papers, contains the true philosophy of this matter also. "That's raythor a sudden pull-up, ain't it, Sammy?" asked the elder Mr. Weller; "Not a bit on it," answered Sam; "she'll wish there was more, and *that's the great art o' letter writin'*."

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be produced, or of the frequency with which it exists. Running, jumping, wrestling, lifting heavy weights, pulling upon ropes in the manner in which this is done in certain games, all are efficient in causing this serious mishap; no age and neither sex is exempt from it, although boys are more apt, from their vigorous methods of play and exercise, to suffer from it than are girls; the records of a single institution[1] show its occurrence in 11,780 individuals under 20 years of age, more than seven thousand of these being of about the average age of the children in our public schools, and the surgeons' examinations made during the civil war showed its existence in a very large proportion of cases. A condition so dangerous, which unfits the subject of it for many of the more active pursuits of life, and one so easily produced withal, merits more attention on the part of our teachers than, so far as our own knowledge goes, it has yet received. Personally we have often gathered the boys under our care together, and by the aid of the charts now very often to be found among school apparatus, or the figures given in any text-book on physiology, made the condition and its dangers clear, and pointed out the means whereby it may be avoided. Any intelligent child can be readily made to comprehend all that is needful concerning it, and the teacher will be none the worse for the study required to enable him to impart the knowledge.

Among the sports of the play ground is one, generally confined to girls, which, while a very desirable form of exercise when used in moderation, is yet liable to abuse, in which case serious organic injury may follow; we refer to the use of the skipping-rope, which in excess may cause grave disturbance and consequent disease of the heart and circulatory system generally, and all the long train of evils consequent upon injury to the spinal cord. Life-long suffering may be in many cases prevented by a few words of warning given to children at the proper time by a teacher who has gained their confidence and respect.

But the oversight of the play ground implies more than attention to those engaged in active sports; the periods of rest are those in

[1] The London Truss Society.

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which injury is often received. Children become heated by active play and exercise, and will, unless prevented, throw off outer garments at the very time when they are most needed, or they will throw themselves down upon the ground, often damp and cold, or in various other ways run risks, the results of which only appear later on in life in various forms of disease.

In the school house, especially if it be built as too many school houses are built, with regard to little except the smallness of the cost at which a structure can be erected, sufficient in size for all the children of school age who live within a certain area to be crowded into it for a given number of hours daily, the teacher's work is arduous at the best, and its difficulties are greatly increased by the restlessness of some pupils, and the seeming stupidity of others, both engendered by the condition of the atmosphere which all are compelled to breathe. Sometimes a teacher with a half or quarter knowledge of the subject, in some conspicuous instances within our own personal knowledge, with even less than this, possessed with the single idea that fresh air must be had at any rate, pursues one of two courses, or vibrates from one to the other in a way that would be amusing were it not so serious, so deadly even at times, in its results. Fully convinced that *cold air* is of necessity *pure air*, and *vice versa*, he waits until the school room has become comfortably warm, and then throws open all doors and windows, regardless of the outdoor temperature or of the force of the wind, although this may be blowing a hurricane, keeping them open until the thermometer stands at the same point both outside and inside, then closing them for the time, to repeat the performance as soon as teeth have ceased to chatter and blue lips have resumed something like their normal appearance; the second method is to keep the windows constantly open at the top, if possible, but open at any rate, subjecting the pupils to a constant draught of cold air, ignoring or unheeding the dangers attendant thereupon. Both ways alike exhibit gross ignorance of the first principles of proper ventilation, notwithstanding which the instructor who practices them is usually the loudest in proclaiming the extent of his knowledge and the soundness of his practice.

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Such persons — and that we have drawn no merely fanciful sketch hundreds of unfortunates will bear witness — are responsible to a very great degree for the aversion, the disgust even, with which many hear the word ventilation pronounced.

"To chill a room is by no means the same thing as to ventilate it, nor is it necessary in ventilating a room to chill it."[1] Even in edifices which have been originally constructed without any adequate provisions therefor, much may be done in the way of introducing fresh air, if not in the full measure demanded by the sanitarian, yet in quantity sufficient to effect a vast improvement upon the state of things too often existing, and of doing this in such a manner as to avoid all danger.

Among the devices which are effective for the purpose are the following: That of placing a strip of board two or three inches in width and equal in length to the breadth of the window, either under the lower sash, or better, at the top of the upper one, thereby leaving a space through which air will pass into the room, being directed upward constantly toward the ceiling, there to become gradually warmed and mingle by degrees with the remaining air of the room; where the sashes do not admit of being raised or lowered, a space for admitting air between them may be made by cutting away a portion of the top bar of the lower sash and the bottom bar of the upper one in such a way as to leave a narrow aperture at the junction of the two, equal in length to the width of the window; a simple valve may be provided by means of which one or more of the openings thus made may be closed should it be necessary. Sometimes the support of the upper sash may be removed and shortened or lowered an inch or so, in which case a narrow strip of board should be so attached to the top of the upper sash as to direct the incoming current of air upward. When the windows consist each of a single sash immovably fixed in the wall, as reports from a number of districts show is often the case, one or more panes of glass may be removed and their places supplied by a louvred arrangement, of equal size, which may be constructed of narrow

[1] Florence Nightingale's Notes upon Nursing.

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strips of glass, such as can generally be obtained wherever window-glass is sold, and which are of no value whatever to the dealer. Panes of glass can thus be replaced without interfering with the light, and with very decided advantage to the purity of the internal atmosphere and the health of the occupants of the apartment.

For removing foul air, the device described by Dr. Reeve, on page 36, of the Fourth Annual Report of this board, may be adopted, or an opening may be made in the ceiling and fitted with a valve that can be opened or shut at pleasure; such a pipe, fitted with a cone or revolving cowl, as is frequently used in wood-sheds or summer-kitchens as a substitute for a chimney, will make a very effective outlet for foul air, and if it be painted black so as to absorb the heat of the sun's rays as they fall upon it, the air within it will be warmed and the velocity of the outflow very materially increased. An article from the pen of Rev. D. C. Jacokes, of Pontiac, Mich., published in the Report of the Board of Health of that state for 1879, describes a method by which a great improvement may be effected in the ventilation of almost any building to which it may be applied, at a cost, it is said, not exceeding ten dollars in any given case. It is essentially the combination of the device mentioned by Dr. Reeve with another also referred to on page 51, of the Fourth Annual Report of this board—a union of the plan of surrounding the stove with a jacket, furnished with a fresh air trunk, with that for the discharge of foul air by means of a pipe connected with the chimney. In Dr. Jacokes' excellent paper, which is worthy the careful attention of all interested in ventilation, all contingencies seem to have been considered and provided for, and plans and working details adapted to all classes of school buildings are given in great profusion.

Closely connected with the introduction of fresh air is the matter of keeping down the dust, so often to be met with in the school-room, and so especially detrimental to health. Whatever may be the fact in regard to ventilation, this is a thing entirely within the teacher's control and for which he may properly be held responsible. The one most prolific source of dust is the blackboard and the work done thereupon; we have seen again and again

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children, rubber in one hand and chalk in the other, intent upon a black-board recitation, surrounded the while by a cloud of chalk dust which they could not help taking into their lungs with every breath they drew. One remedy for this state of things is the use of dustless crayons, which can be had at a small advance over the cost of the common chalk; if the district be too poor, or what is more probable, too parsimonious to make the change, the teacher must instruct the pupils in the methods of using the chalk so as to produce the smallest amount of dust, and damp rubbers must be used in erasing figures and diagrams from the board. Of the serious consequences following upon the continued breathing of a dusty atmosphere, it is wholly needless to say much here. Those who are interested in the matter may find much information concerning it in the section on The Hygiene of Occupation in Buck's Cyclopedia of Hygiene and Public Health; many facts taken from English Parliamentary Blue Books may be found, served up in the guise of attractive fiction, in Charles Reade's novel "Put Yourself in his Place."

The matter of properly lighting the school-room is one which is unfortunately little under the teacher's control, still he can do much not only to insure the comfort of his pupils while they are at work, but to prevent very much of the injury to eye-sight now suffered in our schools. It is but a short time ago that standing in a school-room in which great pains had been taken by a member of the State Board of Health in the supervision of the arrangements of seats and black-boards so that light should fall properly upon the work, we heard a lady of considerable local repute as a teacher express her opinion that the arrangements were very defective because the spaces between the windows had not been utilized (?) for black-board purposes, and great was her astonishment on hearing her proposed *improvement* decidedly condemned; it may be remarked in passing that the apartment in which this same lady presided was usually so foul in its atmosphere as to render it difficult for any one coming into it from the outer air to remain without feeling oppressed and sickened.

An idea very prevalent in the community generally is, that of a

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near-sighted eye being necessarily a strong eye; so far is this from being true that the exact reverse is really the case.

"THE NEAR-SIGHTED EYE IS ALWAYS A SICK EYE," and it is also a mistake to suppose that advancing age will bring about such changes as will compensate for the defects of early life. Near-sightedness very often is progressive, and sometimes terminates in the loss of all sight. The story is by no means an exaggeration, of the man who, consulting a practical optician, was told that after glasses of a certain degree of power had proved ineffective, the next resource was a small but intelligent dog and a string. Children should be taught that near-sightedness may easily and certainly be produced by using the eyes with insufficient light or upon unduly small type. Among its active causes may also be named imperfect methods of illumination, in which are included windows directly in front of the pupil, "any thing that favors congestion of the head, as a bad position of the body, an over-heated room, wet or cold feet, indigestion, excessively prolonged study," the evil habit of crouching over a book with bent head, poring over a story-book or a lesson in a dim light, allowing a child to neglect out-door exercise because "he is so quiet and so perfectly happy whenever he gets hold of a book."

Says Dr. Edward G. Loring: "It can never be said too often that a near-sighted eye is always a sick eye, and a step further may safely be taken by saying that a near-sighted person is, as a rule, a sickly person, especially when the near-sightedness exists in a child, in whom it is often the result of a reduction of the general vital forces, and the expression of a laxity of tissue. The reason why a near-sighted person is apt to be a sickly person is not far to seek. A near-sighted boy, for instance, unless the trouble be very moderate, indeed, in degree, cannot compete successfully with his fellows in any of the games of youth where a nicely-balanced co-ordination is required, for the reason that most of them lie beyond his range of vision. Ridiculed by his companions for clumsiness and inaptitude, due to a physical defect of which neither he nor they are aware, he soon throws aside in disgust the healthful sports in which he can never hope to excel, and turns to books, not as a

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disagreeable duty, but as a recreation, and finally what was at first a pastime becomes a passion, and reading for the mere sake of reading becomes a necessity, a craving which is not only not opposed by parents and teachers, but encouraged and fostered. Abstraction from fresh air and exercise are not the only evils thus engendered; the attitude in which the eyes are used is detrimental to the general health and the due development of important organs; the book is brought close to the eye, the head bent upon the chest or over the table, till the shoulders become curved, the chest contracted and the inspirations are shortened, rapid and insufficient. And not only the physical conditions, but the mental ones also are affected; a near-sighted child cannot see clearly the features of even his own family across the table, let alone those of an instructor across a school room, and hence cannot catch the ever-varying expression of the face by which ideas are emphasized, principles enforced, statements modified. He judges of men and their intentions rather by the sound of their voices than by the expression of their faces in connection therewith, and he is, for this reason, rather suspicious of strangers and over-confident with acquaintances, and this is even more true of places than of persons; thus he is timid and over-cautious in strange pathways, especially where the light is a little dim, while sometimes to his great bodily harm he will walk blindly into obstacles occurring in a familiar path in a way that seems incredible to those having normal sight.

"*In no possible way, either mental or physical, is a defect in vision a benefit or advantage to the individual who suffers from it.*"

The statement of the causes which tend to produce myopia will suggest also the measures which the teacher can take for its prevention. The child who shows any tendency thereto, and here it may be said that anyone is more or less near-sighted who cannot read letters measuring three-eighths inches in height at a distance of twenty feet,[1] should be carefully looked after, and any inclination

[1] The "test letters" used by oculists are all based upon a visual angle of five minutes; *i. e.*, upon the theory, which rests upon a vast number of experiments with eyes of all kinds, that the normal eye is able to recognize distinctly any object which subtends the above-named angle, at any given distance.

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to overtask the eyes, whether by insufficient light, by means of too small print, or by prolonged examination of minute objects of any kind, should be discouraged and counteracted as far as possible.

Especially should too close confinement within doors and too prolonged study hours be guarded against, and abundant exercise in the open air should be firmly insisted upon whenever stress of weather does not absolutely preclude it. In the school room such a child should have all possible advantages of position as regards the light and distance from the teacher's platform, and this latter advantage should be shared by those who are known or even suspected to be partially deaf, a condition also by far more frequent in its occurrence than is generally supposed. Nor should it be forgotten that anything which tends to prevent a due and full supply of blood from reaching the brain also tends to induce near-sightedness; hence, no tight bands or collars about the neck should be tolerated, and the desk should be so arranged that the head need not be unduly bent over the work, whatever it may be.

And just here it may be remarked that the very general use of the sewing machine may have had its share in producing the large amount of myopia which has attracted the attention of oculists and sanitarians generally within the last few years. So far as our observation has gone, and it has been somewhat extensive, the position assumed by operators is especially favorable to the obstruction of the circulation in the neck and head, while the strain upon the eyes, which are usually brought as close to the work as possible, must be severe, even when kept up for comparatively short times — far more severe when it is continued for eight or ten hours daily; when, furthermore, as is very often the case, the machine is placed directly in front of a window in such wise that the light strikes directly into the eyes of the operator, which are wholly unprotected by shades or other means, it seems impossible to escape the conclusion that we have here a prolific source of mischief so far as the eyesight is concerned.

Under ordinary circumstances the work should not be nearer to the eye than fifteen or sixteen inches, and type equal in size to that with which this page is printed should be read, even by a per-

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son decidedly near-sighted, at the greater distance without any difficulty, and if the light be insufficient to allow of this being done, all work requiring the use of the eyes should be laid aside for the time being. Children should be taught to avoid playing tricks of any kind with the eyes; squinting, turning the lids upward or downward, pressing upon the eyeballs with the fingers, rolling the eyes rapidly from side to side, and all such manœuvres, should be prevented, if need be, by means of punishment.

Pupils should be instructed to rest the eyes at frequent intervals by looking away from the book or other work toward some point as far distant as is practicable. Such a suggestion may startle some teachers, especially among those who pride themselves on having, their school-rooms look like work — "on having every one keep his eyes on his book without gawking around the school-room at every other minute,"[1] rather than on having a school wherein each pupil is possessed of the sound mind in a sound body, so often talked about but so rarely actually seen; nevertheless, the preservation of the sight in its normal condition demands that just this suggestion be carried into effect. When the eye is at rest, it is, or should be well known that it is accommodated for distant vision, and any arrangement of the lens for near objects is only produced and maintained by a voluntary effort which, after a time, becomes fatiguing; as soon, therefore, as any sensation of weariness is felt, the eye should be rested, and this can be accomplished only by releasing it from the strain under which it has been kept; how often this should be done in any case, only the individual himself can decide, and any attempt to decide it for him can lead to nothing except injury to the sight on the one hand, or deceit and hypocrisy on the other. It is entirely true that the eye, like every other organ of the body, can be trained by practice to endure fatigue, and to work upon minute objects for very prolonged periods of time, but great care must be exercised in so training it, or the attempt will result in permanent and serious injury.

A teacher may do much to save the eyesight of his pupils, more-

[1] A literal quotation from a teacher of this class.

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over, by using proper care in making whatever blackboard diagrams and figures the course of instruction may render necessary of sufficient size to be readily seen, and by giving to all lines, whether vertical, horizontal or inclined, a sufficient breadth to insure their being visible without undue effort, *having regard in this particular to the sight of the most distant spectator.* For practical purposes it may be said that letters and figures measuring something less than two inches in length (precisely 1.84 inches) can be read by a normal eye at the distance of one hundred feet, provided that the lines of which they are composed have a breadth of not less than three-sixteenth inches; hence, letters and figures of those dimensions can probably be read across an ordinary school room even by a person having myopic vision in a pretty large degree. To secure a proper breadth of line the habit should be acquired of applying the crayon to the blackboard in such a way as to *make a line equal in breadth to its own diameter;* a little practice will enable the teacher to use the crayon in this way constantly.

Some authorities [1] advise very strongly the entire disuse of the slate and slate pencil in the school room, and the substitution therefor of pen and ink with white or tinted paper, for the reason that experiment has shown that writing upon a slate cannot be read unless it is one-fifth larger than writing executed with pen and ink upon paper, or is brought proportionately nearer to the eye.

It has been said that deafness is a defect of much more common occurrence than is generally suspected. By this, of course, an entire absence of all power of hearing is not meant, but such a deficiency as prevents the subject of it from hearing any words spoken in a voice distinctly audible at such distances as usually exist in our school rooms. Toward the prevention of deafness the teacher can generally do but little; he should, however, be qualified to give such general instructions upon the subject of the hygiene of the ear as will be of benefit to all whose hearing is still unimpaired.

Upon what he can do in the way of prevention we quote the following from the eighth annual report of the New York Ear Dis-

[1] Horner and others.

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pensary,[1] commending it to the careful attention of every teacher: "Partial deafness or impairment of hearing is of so frequent occurrence, that probably *no class of a dozen children can be got together without at least one example of it*, and it greatly interferes with the efficiency of instruction. Attacks of inflammation of the ear frequently result from children being seated too near the stove, or from permitting them to be exposed to draughts of cold air from windows or doors. The ears are thereby rendered very sensitive, and earaches, accompanied by purulent discharges, frequently follow.

"It is strongly recommended that the following method of examination be applied to every scholar at his first entrance into the school, with the object of determining whether any deficiency of hearing exists, and the proper distance of the pupil from the teacher's desk in case the defect be present. Place the pupil at the row of seats furthest from the instructor's desk, and facing the teacher; now in the tone of voice usually employed in conducting the exercises of the school, request the pupil under examination to repeat several sentences dictated for the purpose; such sentences should be employed for this examination *as are rich in consonant sounds*, and thus any deficiency of hearing will become apparent very quickly. When any dullness of hearing is remarked, let the pupil gradually come nearer the teacher's position, the experiment being repeated at each approach. The distance at which he can hear everything that is said with perfect distinctness, as indicated by the process just described, will be that at which he should be seated."

What has been said of the eye is also true in some measure of the ear; where there is any weakness of the organ, anything that tends to lower the general health tends also toward the aggravation of the defect. It ought at the present day to be wholly needless to caution teachers against boxing or pulling the ears of children as a means of punishment, but there are still many who, through ignorance or thoughtlessness, resort to these means of correction

[1] From the pen of Samuel Sexton, M. D.

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almost daily. It should never be forgotten that of all the organs of special sense, the ear is the most complicated; that there are yet many of its parts concerning the functions of which we are totally ignorant or in doubt, but that every new step taken, each new discovery made, shows more and more plainly the marvellous complexity and delicacy of the organ and the ease with which its peculiar power may be impaired or wholly destroyed, and the individual cut off from one of the most important channels of communication with his fellows.

Although not directly connected with the subject of school-hygiene generally, it may not be amiss here to call attention to the amount of injury to the hearing which occurs during the summer season from imprudent bathing. Dr. Sexton, author of the report already quoted, and chief surgeon of the New York Ear Dispensary, says, in a very elaborate paper published in a prominent medical periodical: "It is not easy to make an estimate of the number of aural cases (of injury) arising from bathing during a single season, but with the best data within reach, it is safe to say that the physicians of New York city see *no less than one thousand cases* of such injury during the bathing season, i. e., the months of May, June, July, August and September, and at least as many more occur in which no advice is sought."

He also calls attention to the fact that in all aquatic animals, without exception, the most careful provision is made to prevent all access of water to the external ear, arguing thence that such access is always attended with danger, and giving a list of many cases in support of his argument. He finally advises that bathing should be indulged in with some precaution against the admission of water to the auricle, and that such precaution of the most efficient kind be adopted by all who are in the habit of amusing themselves by diving, which practice, however, he considers dangerous in a very high degree. He also condemns the practices — and in this all sanitarians agree with him — of remaining too long in the water, and of bathing twice, thrice, or even more times daily. The whole period of an outdoor bath, including undressing and dressing, should not exceed thirty minutes at the utmost, and would be better reduced to fifteen or twenty minutes.

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A knowledge of these facts may well be disseminated by teachers, and may be productive of great good.[1] And just here we may also refer to the several series of health manuals or primers recently published, both in the United States and in England, especially to those having direct reference to the hygiene of special senses, the greater part of which are written by men who are acknowledged masters of their subjects. From these little works, teachers may readily and cheaply obtain a large amount of valuable and trustworthy information upon matters relating to the conservation of health — information that may be of daily practical use in the school room.

In former papers we have alluded to the wretched character of the out-door accommodations attached to by far the larger proportion of Wisconsin school houses. So long as the criminal condition of things described in those papers is tolerated by the people of the state, there will be a most important responsibility resting upon our teachers; i. e., the responsibility of doing all that lies in their power to prevent the evil consequences which must inevitably result from such condition.

Take, for instance, a case where, for a school house accommodating between three hundred and four hundred pupils and always filled, sometimes over-crowded, the whole privy conveniences are contained in a single structure measuring ten by sixteen feet on the outside; such a building by the closest economy of space might be made to contain thirty seats though all internal screens must be sacrificed in so doing and an economy practiced which would not be tolerated elsewhere. Fifteen minutes upon the average is the time allowed as recess throughout the state, and the theory prevailing among the majority of teachers is, that the object of recess is to give an opportunity for attending to the calls of nature without interrupting the regular routine of the school by demands on

[1] Among the publications of this board is a small circular, giving instructions for the treatment of the apparently drowned, which should receive a wide circulation, especially among the older boys in our public schools, who might also be profitably drilled in the execution of its methods. It may be had on application therefor, free of all cost.

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the part of individual scholars. Now, every one is well aware of the part played by habit in modifying the functions of the body, and of the further fact that habit is powerful in establishing periodicity in the performance of some of the most important of those functions; it is probable, moreover, that this tendency to periodicity is more readily established in children and young persons generally than in adults, by reason of the greater plasticity of the organization during the time of growth and development. Thus much being admitted, let us see what follows: The habit of relieving the bowels and bladder at a certain hour daily being once formed, and the accommodation for so doing within the space of time allowed therefor being wholly insufficient, the weaker will inevitably be pushed aside by the stronger, with one of two results, one of which, though only too familiar to mothers, may better be left to the imagination than described; in the other event, the will is called upon to aid the power of the restraining muscles, the act is postponed indefinitely, and the child suffers injury, in too many cases irremediable. It is far better that children should be allowed to leave the school room when necessary than that harm of this kind should be done even in a single case; far more so when the cases are many. Every one knows the discomfort, amounting often to actual pain, attendant upon forced postponement of the acts of defecation and micturition, discomfort and pain always badly borne by children and youth in whom vital processes, especially those of waste and repair, are active; it may very often be the case, moreover, that at a date prior to that of the child's first attendance at school the habit of relieving bowels or bladder at some hour other than that assigned for the general recess has already been established, a circumstance which would give a good and sufficient reason for indulgence. Let all proper restrictions be made, and all reasonable precaution taken against truancy and idleness; our personal practice was to require any time taken out of the regular school work to be made up at recess, and where we suspected strongly that idleness rather than actual need prompted a request for temporary absence, we required a double or triple return; real necessity will readily consent in the one case and the detention

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may be remitted at the teacher's pleasure, while the idler will not usually fancy a prospective confinement while his schoolmates are enjoying liberty out doors. In any event, it is better that indulgence should be granted ten times a day needlessly rather than that any child should suffer the injury from failure to respond to imperative natural calls which we venture to say that every physician in active practice has seen in by far too many cases.

In several schools of which we have had some knowledge, the rule has prevailed that any pupil arriving at a time later than that set for the beginning of the daily exercises, shall be excluded from the building until the hour of recess, the ground assigned for the enforcement of such a regulation being that it tends toward the prevention of tardiness. We trust that the schools are not many in which this rule is in force; we are well convinced of the advantages of early teaching a child the virtue of punctuality, but we question very seriously whether any such method of inculcating the virtue in question has not disadvantages which seriously outweigh its merits.

Let us consider a case; a child perhaps naturally delicate in health, but ambitious to succeed in study, starts from home at an hour which he trusts will enable him to reach the school house in ample season; he has perhaps a mile, perhaps two miles to go, the weather is stormy, a heavy snow is falling rapidly and a strong wind is blowing; the mother would willingly have persuaded the child to remain at home for the day, but has given way, unwisely perhaps, to his strong desire to lose no time from school. He, too often *she*, struggles along the road against the wind, becoming each moment more and more exhausted from both physical exertion and mental worry, lest with all his efforts he shall be too late, and reaches the school house door at last, tired out, chilled to the very bones, with wet, cold feet, to find the door closed and to know that he must wait without in the storm and cold for an hour or more before he can gain admission, or start again on the weary journey homeward. This is no fanciful sketch, but a plain account of what must sometimes happen under the operation of the rule above described wherever it is strictly enforced. It is entirely true that we have

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known of cases where its evil results were greatly lessened and its severity mitigated by the kindness of the good people living in the vicinity of the school house, who threw open their doors to children from a distance who were late, in cold or otherwise inclement weather, and in one instance by the repeated and direct violation of the regulation by a teacher who said, "When I see any of my little ones outside after nine o'clock I open the door and bring them in. I will not see a child standing out in the cold and suffering if I am able to bring him in,— rule or no rule," and we fully approved both her feeling and her practice.

Let mitigating circumstances be what they may, however, such a rule is well calculated to do great physical harm, to lay the foundation in some cases of serious disease, and to develop in yet others the germs of maladies which, under more favorable circumstances, might have lain dormant or been entirely eradicated. The only purpose that such a rule can serve is that of giving the school a factitious character, and one which is by no means deserved, for the punctuality of its students; while in the one case a pupil is marked on the register as being three, five, ten or more minutes late, he is in the other recorded as being in attendance so many quarter or half days, the actual fact being that the method of recording is a mere device, which deceives only very superficial observers, to avoid noticing a lack of punctuality that nevertheless exists, the pupil for this purpose being arbitrarily compelled to lose one, two or more recitations, and perhaps to endure as well the vicissitudes of the weather meanwhile.

This matter is one wholly within the control of the teacher, and wherever such a rule exists, especially in districts where the school house is remote from any dwellings, its operation should be suspended in winter at least, if it be not wholly abolished, and thus all danger be avoided.

The consideration of the barbarous regulation just discussed leads to that of another matter, somewhat allied to it, but one for which the teacher is not responsible, at least in the same way. Every one who has attained to years of discretion knows or should know the danger attendant upon sitting for two or three hours with

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wet feet or damp clothing. Many of the children who attend our public schools, however, are too young to be aware of this danger, and, most unfortunately, many of our teachers are also too young to think for their pupils, and either to remind them to do for themselves, or to do for them what often needs doing in bad weather. Young children should be looked after when the roads are in bad condition by reason of rain or snow, as soon as they enter the school-room, and, if their feet are found to be wet or damp, whatever means are within reach to prevent ill consequences should be at once employed. We know full well that, as our school houses are at present constructed, it is a difficult matter, perhaps in many cases an impossible one, to give the care and attention needful in this respect, and therefore, in former papers we have urged the necessity of making provision in all school buildings for drying shoes and wet outer garments whenever the state of the weather renders it needful; but we believe that very much more might be done than is done at present were all our teachers as alert as some are to make the best use of existing facilities. Every successful teacher knows well how much attention is given in almost every community to suggestions emanating from the head of the school, and how much can thus be accomplished. Very many parents could be induced to provide an extra pair of stockings and other foot covering which might be kept at the school and worn in case of need during the process of drying the ordinary out-door wear, and some among the elder pupils might be deputized to oversee the changes at the proper time.

A matter wholly within the teacher's control, one which is much discussed withal, and one upon which the ideas generally entertained are exceedingly hazy, is the amount of moisture that shall be added to the air of an ordinary room by means of evaporation. In how many school-rooms can the pan of water be seen upon the top of the stove, having been placed there with some vague idea that the air must be artificially "moistened" in some way, to render it entirely fit for respiration! While it is entirely true that air may be rendered so dry, apparently, as to make it uncomfortable to breathe it, it is also true that such a condition is one very unlikely

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to be reached in any ordinary school-room, and that it is a matter of very grave doubt, to say the least, whether the practice of keeping the air in such a room saturated with moisture is one at all conducive to health.

It is not, perhaps, generally known that even in school-rooms where no special means are provided for increasing the moisture of the atmosphere, the amount present never falls below 40 per cent. of that needed to saturate the air, and usually reaches a much higher figure; nor is the fact very widely understood that an atmosphere having a temperature of 65° to 75° Fah. may fall to a point several degrees lower, without the change being perceived, or producing any special discomfort, provided the amount of watery vapor therein is increased to nearly the point of saturation at the same time.

It must not be forgotten that a warm and moist atmosphere furnishes the most favorable conditions for decomposition of both animal and vegetable substances, and it must also be borne in mind that the skin and lungs are both great excretory organs, the former especially being a very active agent in removing superfluous water from the system, its activity in this respect being greatly increased by warmth. Dr. Winsor has calculated that in a room containing fifty persons, about three pints of water per hour are added to the air, through the agency of the skin and lungs, "a rate of evaporation quite equal to that of most furnaces supplied with an evaporating pan."

Yet more; in a paper read before the American Social Science Association in 1877, Dr. Winsor uses this language: "It must be a very dry atmosphere where fresh meats can be cured by simply hanging them in the open air, but countries and regions where this may be done are notoriously salubrious. The following passage contains the strongest statement concerning the sanitary properties of dry air with which I am acquainted. 'The Harmattan is a wind which blows from the interior of the Sahara to the west coast of Africa, sometimes lasting one day, sometimes fourteen days or more; during its prevalence everything dries up, leaves become so parched that they can be rubbed to dust between the fingers,

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covers of books, though shut up in trunks, warp as if exposed to a fire, household furniture cracks, door-panels split and veneered-work flies to pieces. But another, and the most striking feature of the Harmattan is its salubrity; though occasioning disagreeable parching effects, it is highly conducive to health; those laboring under fevers generally recover under its influence, the feeble grow strong and malarial diseases disappear.'[1] Sprenger bears enthusiastic testimony to the healthful and invigorating qualities of the climate of Arabia, and Palgrave testifies to the same effect."

Not very long since we received a copy of a local newspaper in which was an account of an experiment apparently made for the purpose of determining the effect of watery vapor in the atmosphere upon the diffusion of heat through a given apartment. This experiment, which seems to have been made in the crudest possible way and without the employment of any of the means which give value to observations scientifically made, seeming not even to have been repeated under known conditions differing from those of its first performance, would hardly be worth notice here were it not for the fact that the article having reference to it appears to have attracted some attention among school officers and teachers generally, some among whom appear to think that by saturating the air of a room with watery vapor a considerable saving in fuel is to be effected while the health of the pupils and teachers may be also benefited,— though this last seems to be a merely secondary consideration.

So far as the question of health is concerned, what we have already said will indicate in part our own opinion upon the matter, and we shall endeavor to leave no room for doubt as to our position before we close; with regard to that of economy or saving of fuel there can be none whatever, as would be conclusively shown by a very elementary study of the laws of evaporation. Dr. Billings, of the National Board of Health, in a paper very recently published, has put this matter in a light so clear that we quote from him: "Simple dryness of the air is certainly not injurious to the

[1] Dr. Wyman.

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health. At Fort Yuma, during April, May and June, when no rain falls, the average temperature day and night is 90° Fah., and the air is so dry that the skin becomes dry and hard, the hair crisp, and furniture falls to pieces; newspapers must be handled carefully or they will break, and a No. 2 Faber's pencil leaves no more trace on paper than a piece of anthracite. Yet this may go on for weeks in succession and no sickness will occur. * * * It is therefore evident that is not necessary to supply moisture enough to heated air to bring the percentage up to 70 (of the amount needed for total saturation). [1] *It is also to be noted that it will take the same amount of fuel; will cost as much, in other words, to furnish this percentage of moisture to air heated from* 32° *to* 70° *as it does to heat the air.* Moreover, in a room properly ventilated, under such circumstances it would be practically almost impossible to maintain such a percentage of moisture, owing to the great rapidity with which watery vapor diffuses itself through dry air and the condensation upon walls and windows."

The foregoing passage indicates very clearly the reason of the results supposed to have been obtained in the experiment already referred to, and renders further discussion of them wholly needless. Experiments, however, are not wanting which have been conducted with scrupulous care, and with the observation of all the refined precautions which modern science demands, including extension over a long space of time, and repetitions under all possible conditions. From these we select the tests made at the Boston City Hospital, a full account of which may be found in the Report of the State Board of Health and Charities of Massachusetts, for 1879. "The percentage of humidity was at times very low" (the instruments used were carefully tested, and the readings taken from the table of the United States Signal Service, which bureau also furnished the observations of the external air). "I believe that no discomfort has been felt or ill effects produced from the low relative humidity, even on occasions when there was only fifteen to twenty-one per cent. of saturation. Certainly, there is uniformly

[1] The italics are ours.

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observed a remarkable absence of complaint of any kind, that can be ascribed to the condition of the air, and a peculiar feeling of its freshness and purity is frequently spoken of by those who enter the room. These conclusions do not accord with the theory that the uncomfortable sensations experienced in warm, dry rooms are due to any absence of moisture, but rather are corroborative of the probability that such sensations are really caused by an insufficient supply of fresh air."

Such facts as those above presented are worthy of the gravest consideration, especially by those who have been accustomed to the use of the evaporating pan. We know that there are authorities who claim that the air should contain not less than 70 per cent. of the amount of watery vapor necessary for its saturation, but so far as we are aware, these estimates are all made upon purely theoretical considerations, rather than upon the solid basis given by actual experiment. The conclusion to which the best men seem tending is, that the drier an atmosphere the better it is, from a sanitary standpoint; and the reasoning presented in support of this conclusion certainly has not as yet been answered, much less refuted.

From the most careful survey of the whole field that we have been able to make, we should advise under all the conditions usually to be found in the school room, the entire disuse of any appliances for artificially increasing the moisture of the air, and the substitution therefor of better methods of heating and ventilation. There can be no saving of fuel worth considering by employing such devices, and to subject children to the evils of foul air and crowd-poisoning, for the sake of enabling the district treasury to show an increase of five or ten dollars in the cash on hand at the end of a term, will prove very poor economy.

Yet another and a most important branch of our subject is yet to be discussed, a branch which concerns not only the health and lives of those directly attendant upon our schools, but oftentimes the health and lives of whole communities. We refer to contagious diseases and what the teacher can do in connection with them.

In some few instances local health boards have taken up this

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matter, but in a very feeble and insufficient way; the duty of such boards all over the state is to make simple and practical regulations concerning contagious diseases among other things, which should be properly published, and thereafter rigidly and impartially enforced. In very few instances, however, has anything of this kind been done, and the teacher stands on the one hand exposed to the wrath of the parent whose child has been excluded from school under the suspicion, perhaps the certainty, that he is the subject of contagious disease, or, on the other, to the censure of a community because he has not arbitrarily exercised a power which they have never given him, and has not sent home a sick child. Still there are many things that the teacher can do and should do which would tend to limit, in many cases, the spread of contagious disease. Among these he should rigidly exclude the members of any family or the residents of any house in which any contagious disease is known to exist until such time as some reputable physician will certify that readmission is safe; when Scarlet Fever, Measles, Diphtheria or any dangerous disease similar in character is known to exist in the neighborhood any child who shows any unusual vivacity, uncommon fretfulness or irritability or any one in whom is observed one or more of the following conditions, i. e., an increased heat of the skin, flushed or pallid countenance, greater brilliancy or dullness of the eye than is usual; any one who is observed shivering — others being comfortably warm at the time — who complains of weariness, or a general sense of fatigue and malaise, of pain in the loins, headache, etc., or who asks frequent permission to drink or leave the school-room, any child in whom one or more of the above indications are observed should be at once sent home; it may not be that any specific disease is developing itself, but the grounds for suspicion in such a case are strong, and the child in such condition is assuredly better off at home and under competent medical care and parental supervision than he is at school.

Neither parents nor teachers should forget that the power of reproduction in these diseases does not cease with the convalescence of the patient. In Measles, at least ten days after that point is reached, the malady may be communicated, while in Scarlet

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Fever a much longer time elapses before its power of imparting its specific contagion is exhausted. In all these diseases the poison from which they originate seems to cling very tenaciously to hair and woolen materials, especially those of loose and open texture, as well as to clothing generally; hence every precaution should be taken to insure the thorough disinfection of any such articles as were worn at the time of attack by contagious maladies, as also of the hair of the patient. The fatal results that may follow from a lack of care in this particular were terribly illustrated in Vermont, in the case of the Newark school house, where sixteen out of twenty-two children were stricken down with malignant Diphtheria within six days, and where forty-eight persons in all, out of a little community of ninety-two, suffered from that terrible malady, the original germs of which came from a single infected garment. And the records of this board and of others throughout the country contain instances similar in kind, though happily not so fatal, enough to establish beyond all doubt the fact that contagion is often spread through communities by carelessness on the part of parents in allowing garments to be worn which contain the specific form of poison which produces disease, and perhaps also by a lack of knowledge on the part of teachers that such poison can be so conveyed and disseminated.

In the event of the death of any pupil from contagious disease of any kind, his school-mates should be cautioned against the danger of attending the funeral, and the teacher should endeavor by all means in his power to prevent such attendance. It must be remembered that the indulgence of a sentiment, however tender and beautiful, even ennobling it may be, can be of no possible advantage to the dead, while it may be a source of no small danger to the living. It may be said that each one has an undoubted right to expose himself to danger for the sake of a sentiment, if he so chooses, but certainly he has no right to endanger the health and lives of others without their own consent, for the sake of gratifying a feeling, and most especially is this true when the gratification of personal feeling, and that alone, is concerned — where no good beyond this can possibly be accomplished, while serious harm may

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very probably ensue. We are well aware that all that any teacher can do in such cases is to advise, but what teacher is there who does not know — rather what teacher is there who *does* know how far his influence reaches, what may be the real measure of his power in the community in which he dwells?

It would be well if, prior to the admission of any child to our public schools, he were required to produce a certificate of proper vaccination, or in default thereof, to be examined for evidences in the form of a proper cicatrix; if this were not present he should be obliged to undergo the operation by the medical officer of the town or district as an indispensable preliminary to admission. This course is universal upon the European Continent, and we believe an equivalent regulation exists in England also. There might possibly be a few who would object to the enforcement of this salutary rule in this country, but we believe that all objections would soon cease and that only favorable results would follow.

In many respects the state of Wisconsin has shown a wise care for the welfare of the rising generation; in former papers we have referred to her grand provisions for education, but in other matters also she has shown that she appreciates fully the value of childhood, and her determination that the vast privileges of that most precious and most important period of life shall be secured to every one born and brought up within her borders. She has provided that no child under twelve years of age shall be employed in any manufactory in the state; that no child may be compelled to labor in any factory for more than eight hours, or permitted to labor more than ten hours daily; that no child under fourteen may be so employed for more than seven months in any one year; and finally the school boards throughout the state are required to ascertain in any manner that they may deem expedient the condition, physical and mental, of all children within their jurisdictions who are not in attendance upon some public or private school, and also to prosecute the parents of all children for whose non-attendance satisfactory excuse is not given. Apart from these matters she has provided that no child shall be engaged in any pursuit whatever

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by which life or limb shall be endangered, and proper penalties are prescribed for all violations of these laws.

Let her now turn her attention to the conditions shown to exist in some of the buildings in which her children are daily assembled, nominally for instruction, really for slow poisoning by overcrowding and foul air, buildings such as are to be found in the metropolis of the state, "dilapidated, old, without the slightest pretensions to school conveniences, badly situated, unwholesome, I might say dangerous, which should be abandoned at once,"[1] buildings in which more than two hundred children are crowded into a room measuring thirty-nine by thirty-four feet, furnished with desks for one hundred and fifty, allowing only six and one-half square feet on the floor for each individual, no allowance whatever being made for furniture, etc. Let her once fully comprehend how Diphtheria, Measles and Scarlet Fever are spread through whole communities by the agency of such buildings; how homes are desolated, and many a Rachel is caused to mourn because her children are not; let all these, and many more things like these, be fully understood by Wisconsin and her people, and a demand will soon be made that neither school board nor legislature will be able to resist or refuse, that such blots upon her educational escutcheon shall be speedily erased.

Absolute perfection in all the appointments of our school houses we do not look for speedily; none the less, however, is it a duty to hold up a high standard of comparison; none the less shod we aim to present a lofty ideal, and strive, with all the might that God has given us, for its perfect realization.

[1] Vide Prof. McAllister, report published in *Milwaukee Sentinel*, October 25, 1880.

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THE MANAGEMENT OF CONTAGIOUS DISEASES

IN THE CITY OF MILWAUKEE.

BY O. W. WIGHT, M. D., HEALTH COMMISSIONER.

[The following paper was originally prepared for the American Public Health Association. It is printed here by the kind permission of the Executive Committee of that organization:]

In response to an invitation by the president, I have undertaken to explain, in the briefest way, my method of managing contagious and infectious diseases in the city of Milwaukee.

The city charter empowers the commissioner of health "to forbid and prevent all communication with any house or family infected with any contagious or pestilential disease, except by means of physicians and nurses."

The charter also requires "each and every practicing physician in the city of Milwaukee to report in writing to the commissioner of health every patient he shall have laboring under any pestilential, contagious or infectious disease within twenty-four hours after he shall ascertain or suspect the nature of such disease."

The charter also enables the commissioner to prescribe the form of such reports and to issue general orders in regard to various matters pertaining to the public health.

A city ordinance provides that, "It shall be the duty of the commissioner of health to cause a notice, printed or written in large letters, to be placed upon all the outside doors of any house in the city of Milwaukee, in which any person may be affected or sick with small-pox, scarlet fever or diphtheria, upon which shall be written or printed the name of such disease; and such notice shall remain upon such house until the case shall cease to exist and such house shall have been thoroughly disinfected; and if any person or

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persons shall deface, alter, mutilate, destroy or tear down such notice, without permission of the commissioner of health, such person or persons shall be liable for each offense to pay a fine of not less than twenty-five nor more than fifty dollars; and the occupant of any house upon which such notice shall be placed or posted as aforesaid shall be held responsible for the removal of the same, and if the same shall be removed without the permission of the commissioner of health, such occupant shall be subject to the like fine of not less than $25 nor more than $50, unless he shall notify the commissioner of health within twenty-four hours after the removal of the said notice."

The ordinance further provides that, "when from current rumors or from any other reason a suspicion exists" that such diseases prevail in any family or household, "it shall be the duty of the commissioner of health to ascertain personally whether such is the case," and to enforce the law.

At the beginning of my administration, in the spring of 1878, I issued a circular to all the practitioners in the city, notifying them that the law requiring them to report cases of contagious and infectious diseases within twenty-four hours would be strictly enforced. Half a dozen prompt prosecutions convinced the profession that the health department was in earnest. One quack, unable to give bail, lay in jail till the day of his trial. One haughty and fashionable "doctor" was driven on the witness stand, under cross-examination, to swear that he had no diploma and was a mere pretender.

Physicians in the city are gratuitiously furnished with postal-cards, on the backs of which is a blank to be filled, showing the name of the patient in full, sex, nationality of parents, patient's birthplace, number and street, ward, age, married or single, disease and date. It requires but a brief time to fill out this blank at the bedside. The postal-card can then be dropped into the first letter-box which the physician passes after leaving the house, and it is sure to reach the health officer within a few hours.

The following is the form of this blank:

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REPORT OF SICK CASES.

Name of patient in full.	Sex.	Parents' Nationality.	Patient's Birthplace.
1.....			
2.....			
3.....			

No. and street. Continued.	Ward.	Age.	Single or Married.	Disease.
1.....				
2.....				
3.....				

Dated ——, 188—.

Maximum penalty for neglect to make daily report to the Commissioner of Health, $250.

When the card reaches the health office, the commissioner writes upon its margin the name of the assistant medical officer of health in whose district the case may be located, and at the same time fills out and signs the following order:

No. ——.

HEALTH DEPARTMENT OF THE CITY OF MILWAUKEE,
Milwaukee, ——, 188—.

To ——, M. D., Assistant Medical Officer of Health:

It having been reported to this office that there is infectious disease, to wit: ——, in the house known as No. —— street, —— ward, you will proceed without delay to placard said house according to the requirements of law, and at the same time to leave with the attendants the proper circular issued from this office for the sanitary management of said disease; to ascertain the number of persons exposed and the amount of exposure; to make diligent inquiry as to the contagious or other origin of the disease at that place; to make a careful personal examination of the sanitary condition of the premises and surroundings, and to make a written report to the commissioner of health on all the points above indicated, with such other suggestions as you may think advisable. The examiner will not, by word, look or act, interfere with the practice of the attending physician.

——, M. D., Commissioner of Health.

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The card and the order are passed to the secretary for registration and indexing. Twice daily the assistant medical officers report to the commissioner for duty, when they receive these cards and orders and hasten to placard houses as directed.

The placard is eleven by fourteen inches in size. The small-pox placard is printed in large black letters on a bright yellow ground; the scarlet fever on a red and the diphtheria on a lead-colored ground. On the top of the placard is the name of the disease in the largest possible letters, under which is the following warning: "$25 to $50 fine for removing this notice without authority from the commissioner of health. If removed, occupant of house must report to health office within twenty-four hours, under the same penalty." On the lower half of the placard the same thing is repeated in German, as about one-half the population are of that nationality.

At the time of placarding the house the assistant medical officer makes a sanitary inspection of the premises and reports in writing. His report, the order and the card, already mentioned, are pinned together and placed on the desk of the health commissioner for examination and approval. Such reports not infrequently give rise to additional orders to occupants or owners of the premises to clean vaults, fill up or drain low grounds, remove manure heaps or other filth, to empty and cleanse foul cisterns, to close up polluted wells, to overhaul defective plumbing, to make connections with the public sewer for the purpose of safely removing slops, wash-water and other liquids, etc.; all of which pertains to another branch of the administrative sanitary work of the department. These reports of the assistant medical officers are numbered, indexed and filed away by the secretary for future reference. In time they will accumulate sufficiently to form the basis of some important statistical generalizations.

As often as reports of contagious cases come in from the city practitioners, notice thereof is immediately sent by means of postal card blanks to the public and private schools in that neighborhood, the teachers of which are under orders not to admit pupils from infected houses under penalty of prompt prosecution in the criminal court. The same notice is also sent to the public library.

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When a case of contagious disease recovers, the attending physician usually sends notice to the health office, although he is not obliged by law to do so. If he neglects to perform this service the family is sure to give him a sinister blessing, for the placard then remains on the door for a month, when it is looked after by the health department. Some of the doctors, to please their patrons, have reported recovery suspiciously early; in which case a visitation is made by the health commissioner or one of his medical assistants, and, if suspicion is verified, a severe rebuke is administered to the practitioner who dares to trifle with the public safety. Burke, who murdered his fellow-creatures in order to sell their bodies for dissection, was a Christian and a gentleman in comparison with the medical fiend who connives at the spread of contagious disease in order to increase his practice.

When a case of infectious disease terminates, by recovery or death, a trained person is sent from the health office to disinfect the house and take down the placard. Disinfecting is done by the approved process of burning sulphur in the rooms, closed as tightly as possible. A reliable and careful man is employed for that special purpose.

Public funerals are strictly prohibited in cases of death by contagious diseases. All the undertakers and clergymen in the city are under stringent orders to this end. Two or three threats of arrest were sufficient to enforce the orders. Funerals, in such cases, are now quietly conducted at the homes of the deceased, and no young person is allowed to act as pall-bearer. The transition is very great in a city where, four years ago, small-pox funerals were held in churches. The enlightened majority of the clergy are entitled to credit for efficient aid in this part of the sanitary work.

Railroad officials, expressmen, public carriers, and all other persons are forbidden to bring to Milwaukee any person laboring under an infectious disease, or the remains of any persons having died of such a disease. There have been only two violations of this regulation in as many years. In one case a man brought clandestinely at night the remains of his child, deceased with scarlet fever, from a neighboring city. The imperative necessity of getting a burial

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permit from the health office compelled the undertaker to reveal his employer, and the man fled from the cemetery to escape the sheriff. In the other case, a railroad train from Chicago was arrested at the city limits and a whole funeral cortege put off and ordered to take a suburban road to the extra-mural place of burial. These examples have been enough, and nobody seems desirous of repeating the experiment.

The circulars left with families by the assistant medical officers, at the time of placarding their houses, give pretty full directions for the hygienic management of the different infectious diseases. These circulars have been compiled from the best sources. For example, that concerning scarlet fever is in great part a copy of the excellent circular issued by the Massachusetts State Board of Health. In this way useful information concerning infectious diseases is diffused among the people. A family afflicted with a contagious malady is generally in a mood to receive such information and profit by it.

In dealing with small-pox, vaccination of all exposed persons is added to the procedure already described. In fact, there has not been a case of small-pox in Milwaukee since two years ago last July. When I took charge of the health office of the city, in the spring of 1878, I found small-pox in half a dozen different localities. It seemed determined to linger, till I made use of the extraordinary power conferred on the department by the legislature of the state in the municipal charter, "to forbid and prevent all communication with any house or family infected with any contagious or pestilential diseases, except by means of physicians and nurses." By such a rigid system of domiciliary quarantine the foul disease was "stamped out," and has not returned.

The advantages of the system may be briefly stated —

1. It enables the health department, and the public through the health department, to know every day in the year the exact number of cases of infectious diseases in the city and their precise location. Rumor and sensational exaggeration in regard to the prevalence of contagious maladies, which are liable to alarm the people needlessly, and to interfere with the pursuits of life, can

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then be corrected by facts. And the truth of a violent epidemic cannot be suppressed in the interest of commerce to the criminal endangering of the outside world.

2. The exact percentage of mortality is constantly known, revealing the severity or mildness of an epidemic.

3. The system affords especial means of studying the conditions under which contagious diseases flourish, or to what extent they are influenced by sanitary surroundings.

4. It diminishes the spread of contagious diseases by protecting large congregations of children in schools from the presence of those bearing infection in their persons or clothes; by preventing exposure of the living at public funerals; by revealing to all who can see and read the places where such diseases may be caught, and by destroying the lingering germs of contagion in sick rooms by means of thorough disinfection. My experience convinces me that a community will give a wide berth to small-pox, scarlet fever or diphtheria if you will only let them know where it is. I have frequently seen quite small children cross over to the other side of the street when approaching a house on the door of which was placed a placard revealing the existence of contagious disease within. It is wicked to conceal from God's little ones the fountains of infectious suffering and death.

The difficulties of carrying out the system are considerable, but not insuperable.

1. While the majority of educated physicians are ready to co-operate with the health authority in carrying out any reasonable system of protecting the public from contagious diseases, the negligence of many and the perversity of a few must be overcome by the unflinching execution of law. To the credit of the profession in Milwaukee, it must be said that no one has raised the question of fees for reporting contagious diseases to the health office. An unseemly discussion of that question is now going on in Great Britain. The medical practitioner depends upon the patronage of the public, and should be willing to do for the public at large a service that costs very little time and trouble and is attended with no expense. It is a fortunate feature of the law that it requires

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the attending physician to report a contagious disease as soon as it is suspected. For that reason the public receives the benefit of a doubt. The necessity of reporting to the health office all deaths, with the causes, in order to get a permit to bury, puts the doctor on his good behavior. A few attempts to return croup for diphtheria, spotted fever for scarlatina, etc, have been met with an order for a coroner's inquest. Inability to make a diagnosis has sometimes been urged as an excuse by delinquent quacks, but one or two criminal trials soon revealed to them that the responsibilities of assumed knowledge cannot be avoided by a plea of ignorance. In some instances doctors have prematurely reported recovery. The law of duration in contagious diseases is too well known to allow such heedlessness to escape notice and rebuke. It is sometimes disagreeable to supplement the mental and moral defects of a portion of the profession by the terror of criminal law, but faithful sanitary administration requires it.

2. At first the people objected to having their houses placarded, as a violation of personal liberty. A little argument convinced reasonable citizens that no man has the natural or acquired right to expose his neighbors to deadly contagious disease by concealing it in his own house. Personal liberty to give small-pox to somebody else had better be abridged as soon as possible. Personal liberty to send scarlet fever into a school with your child is rather diabolical than beneficent. Personal liberty to infect a church with a diphtheria corpse is tempting Providence to start an epidemic. But many were beyond the reach of argument. A fortunate accident of legislation solved the problem. The alternative was placed before them of quietly submitting to the placarding process, as provided by city ordinance, or of being subjected to absolute quarantine in their houses, as provided in the charter. A law-abiding community submitted, and to-day the system of placarding, if it were left to an election, would receive an overwhelming majority of votes in its favor. Experience proves its value in many ways to the citizen. He knows and feels that, by reason of it, his family is more secure against diseases that cost money, anxiety and sorrow.

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Management of Contagious Diseases.

The defects of the system are already apparent to educated sanitarians.

1. So far as small-pox is concerned, proper vaccination and re-vaccination at suitable ages should be universal and compulsory. I am sorry to say that, in this respect, the sanitary code of Milwaukee is defective. Without vaccination suppression of the disease allows the greater accumulation of material for the conflagration of an epidemic, that sooner or later may get under way and defy all control. Every escape from scarlet fever is a positive gain, for susceptibility to the disease decreases with age. Diphtheria should be suppressed all the time, for one attack does not secure immunity in the future.

2. The efficiency of the system depends to a great extent on the willing or enforced co-operation of the medical profession. Just so far as the profession falls short of an ideal standard, must the system fail to reach its ideal value, however well it may be administered.

The system in Milwaukee is supplemented, as it should be, by a pest-house, to which the sick with contagious diseases, who have no homes, can be taken. With an efficient system of placarding and isolation, it is more economic, more humane, if not safer, to leave patients who have homes under the care of their families and friends. However excellent a hospital and its service may be, households are unwilling to give up any of their sick members to be nursed by unknown hands in a strange place. To force away children from parents, from brothers and sisters, and parents from children, and from one another, for the purpose of isolating infectious disease, exposes the public by transportation of the afflicted, diminishes the chances of recovery, outrages the unreasoning affections and invades the sanctity of home. Sanitation must reckon with the unalterable instincts of humanity and restrain itself within the boundaries of reasonable endeavor.

Therefore, in my judgment, the isolation of contagious and infectious diseases in the family, which is the unit of our political society and Christian civilization, is wisest and best. After long administrative training, we shall get the willing co-operation of

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households and their chosen physicians. The day will come when exposure of others to our diseases will be recognized as a crime, the punishment of which will be demanded by the public conscience.

In the meantime we must combat superstition, diffuse rational knowledge, and protect the people against pestilence by the simplest and most effective means at our command, winning confidence by patient, kindly instruction, only using repression and the lash of law when we must.

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DISEASED MEAT

AND ITS RELATIONS TO HEALTH.

BY HENRY P. WENZEL, M. D., OF LOMIRA, WISCONSIN.

Though physiologists are not yet definitely agreed as to the use of meat for food, or its necessity for the human economy, notwithstanding the teeth of man having both a *cutting* and grinding surface; many of the North American Indians attained a high physical development upon a vegetable diet; the laboring classes of Continental Europe rarely eat meat; that the healthy Scotch farmers live chiefly on oatmeal; that the former slaves in the southern states received meat rarely; and the Roman soldiers carried large weights and performed feats of great strength and endurance that astonished the world, without eating flesh; yet there are many reasons to believe that a partial flesh diet is the natural diet of man. Vegetarians have substituted milk and eggs for butcher's meat in their diet without suffering from it, but we must remember that milk and eggs contain the elements of animal food in large quantities. Meat is resolvable into a greater amount of force than the other nitrogenous foods.

Animal food is certainly necessary for hard mental labor, and the hard working laborer, enduring physical toil, performs a larger amount of work upon a partial meat diet, than upon a purely vegetable food. Liebig believes that the greater efficiency and endurance of American workmen over Europeans is due to meat. The Hindoo workmen employed on railroads do more labor with a meat diet. Dr. Kane, the arctic explorer, believes that the timely arrival of *fresh* meat saved the lives of some of his men. Dr. Livingstone tells us that, in South Africa, both the members of the expedition and the natives "eat anything to get animal food."

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Diseased Meat.

Carpenter says, "animal flesh is in no way injurious; whilst so far as our evidence at present extends, this seems rather to favor the highest mental development." Haughton's experiments prove this, and M. Metz testifies that his boys in the reformatory school at Mettray become more manly on a liberal (meat) diet.

In Homer's time the poorer classes ate blood-sausages, and in parts of Germany this practice is carried on to-day for want of meat. Whatever physiological theories may prove, it is certain that meat contains nitrogenous, fatty and inorganic elements of food in an easily assimilable form, and its place cannot be supplied by any other substance.

In the earliest historical times meat was used for food, and in the laws of Moses the kinds of flesh, allowed the Jews for food, were prescribed. Moses was perhaps the first "Meat Inspector," and among the Israelites this practice has continued to the present time. They were certainly better protected against tainted meat than any other race of people. Sanitary laws grow apace, and those of the present day are much more perfect than those of the Israelitish or Hippocratean period. Meat may be diseased in the live animal, from acute or chronic diseases or infested with parasites; and carcasses are subject to decay.

"The contagious diseases of domesticated animals resemble in their mode of propagation the zymotic diseases which affect the human race." In some cases they do not produce their characteristic symptoms in man; yet, at times, cases develop, in some form of disease, which terminate fatally. The *Rinderpest* is a contagious typhoid fever affecting cattle; *Pleuro-Pneumonia* is essentially a cattle disease; *Small Pox* affects cattle and sheep; *Anthrax* affects cattle, sheep and swine; "*Maladie du sang*" or Splenic Apoplexy is a disease of oxen; "*Black leg*," "quarter evil," is a disease of calves; *Eczema Epizootica*, or "foot and mouth disease," one of the least fatal, but one of the most contagious diseases, affects cows, attacking the mucous membrane of the mouth and places devoid of hair. Several cases of *Herpes Contagiosa* are reported as following the use of milk derived from a cow infected with this disease. Sheep may suffer from a variety of *Rinderpest*, from

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Diseased Meat.

Small Pox and "*Braxy.*" Hog fever (Law), swine disease (Detmers), or hog cholera, is caused by a parasite, the *Stephanarus dentatus* of Cobbold and Law, or the *Bacillus Suis* of Detmers. The "Soldier," a disease resembling Scarlet Fever in man, also affects swine. Glanders and farcy affect horses, asses and mules. Each and every one of the diseases mentioned in animals has its analogue in man, and who can guarantee protection to health and life against the dangers that may arise after partaking of the flesh of animals so affected? Who will guarantee that the consumption of measly pork or other parasitic flesh will not give rise to tapeworm, trichina or hydatids?

PUTRID MEAT.

There is a vast difference of opinion concerning the evils resulting from partaking of decayed or putrid meat. The epicure prefers meat when it is a "little over-ripe," and many half civilized and savage people like flesh in an active state of decay for food. Prof. Gamgee says one-fifth of the meat sold at the meat market is tainted. Decroix states that putrid meat was devoured during the siege in Paris without baneful results, while Dr. Letheby says: "I have often had to investigate cases of mysterious diseases which were undoubtedly caused by unsound meat."

That decayed or putrid meat is dangerous is shown by the following instances: In 1839, 513 persons sat down to a cold collation in Zurich, composed of veal and ham somewhat decayed. Of these 421—*more than four-fifths of the whole assemblage*—were prostrated with typhoid fever shortly after. Another feast was held at Klotsen, near Zurich (1878), where the chief staple of food was veal, which, being decayed, much of it was given away to those who could not afford to pay for it. About 600 partook of this veal, and 290 were prostrated with typhoid fever. According to Prof. Hugenin this flesh was not only putrid, but also contained specific typhoid poison. Foderé believes that a diet of putrescent meat caused gangrene and scurvy during the siege of Mantua. Olliver reports six persons who ate putrid mutton and became violently ill, and four died. Sir R. Christison observes that 14 persons be-

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came violently ill with diarrhœa and vomiting after partaking of veal so slightly decomposed that its appearance was perfectly healthy. Several years ago, several epidemics of fever, prostration, diarrhœa and vomiting broke out in one of the larger American hospitals, which were traced directly to the use of beef broths made from slightly decomposed beef. Geissler relates that a family of eight persons, partaking of musty bacon, became ill. And in Kangek, Greenland, at a mission station, 32 persons who partook of the putrid brain of a walrus, died. In the minutes of the Rock River Medical Society for May, 1874, Dr. S. Keller, of West Bend, reports several cases of typhoid fever resulting from decayed meat, with one death. May we not trace many mysterious and unaccountable diseases to this cause? Are not many diseases of this state due to the use of decayed meat for food?

Diarrhœa, vomiting, pain in the bowels and prostration are the prominent symptoms, following the use of decayed meat.

Salting partly checks putrefaction, and thorough cooking may sometimes destroy the virus of putrid meat; but not always.

Parkes observes: "It is only logical to conclude from general principles, that all diseases must affect the composition of flesh, and as active putrefactive changes must at all events deteriorate its nutritive value, it is of the utmost importance for health that these substances should be obtained in as sound a condition as possible."

Sharples says: "There has been no definite line laid down between good meat and bad meat. Meat which some people consider just ripe, would be condemned by others." "Meat once tainted is unfit for food." Letheby lays down the following rules for the detection of tainted meat: "Good meat should be between a pale pink and a light purple color; *dark purple indicates that the animal either had an acute fever or died with the blood in it.* It should have a marbled appearance; it should be firm to the touch and leave but little, if any, moisture on the finger. *Bad meat is wet, sodden and flabby, and the fat looks like jelly or parchment.* Good meat should have little or no disagreeable odor; *bad meat has a sickly cadaveric odor.* Good meat does not run to water when standing for a day or more, but dries on the surface. Good meat

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shrinks or wastes but little in cooking; when dried at a temperature of boiling water, it should not lose more than 70 per cent., while bad meat loses much more. Good meat has a decided acid reaction — with test paper — bad meat is neutral or alkaline." This alkalinity is doubtless due to the evolution of ammonia during the putrefactive, chemical changes.

All meat, however tainted, should be condemned and so prepared that it becomes unfit for use. In Milwaukee such meat is destroyed with kerosene oil. In London, where 35 tons of putrid and diseased meat dressed for sale is often confiscated in one day, the meat is plunged into Dr. Sedgwick Saunders' chemical bath, which is composed as follows: Cooper's salts, 2 cwts.; sulphate of iron, ½ cwt.; phenic acid, 2 lbs.; water, 300 gal. (Fox.)

The flesh from animals suffering from chronic wasting diseases undergoes rapid putrefaction, and gives rise to sickness and diarrhœa, expending its fury on the gastro-intestinal tract; the flesh from animals that were overdriven, or died, also decays very rapidly, and presents an unwholesome appearance; this is caused by the blood being retained in the tissues.

Dr. Meymott Tidy says: "It is also the practice to condemn the flesh of animals that have died in consequence of parturition or were killed immediately before, during or soon after parturition, on presumable grounds that they were slaughtered in consequence of some disease or condition which might cause their death." In a case related by Wilson, a sheep was killed by a shepherd because it was too fat to lamb and sick in consequence. The meat was sold for a low price when seized and condemned as unfit for food. On Dr. Tidy's evidence the defendants were sentenced to pay a fine and costs, or be imprisoned for one month.

The flesh of animals feeding on certain plants may become poisonous. The flesh of hares feeding on *rhododendron chrysanthemum* has exerted poisonous effects; pheasants fed on *laurel* have caused illness when eaten; and a case is recorded where the flesh of a turkey proved poisonous, yet on analysis no poison could be found. Certain shellfish have produced fatal results when eaten, also certain fish. And sailors eating the yellow-billed sprat have

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died with the fish in their mouths, or soon after. In 1842 a whole family was poisoned at Toulouse, in France, by a dish of snails gathered from a poisonous shrub.

Water used from receptacles that contained putrid meat may prove disastrous, as in a large city a few years ago. A family of five or six persons partook of soup in which water from a barrel that had contained putrid meat, and had not been properly cleansed, was used. The whole family was seriously prostrated and two cases almost proved fatal.

Tainted meat is bad, but the sausage poison is worst of all. Tainted sausages become soft in the interior and are acid to test paper, probably caused by the chemical changes of the fatty acids (rancid). The mouldiness of sausages is caused by a cryptogamic fungus. Letheby says the poisonous properties are generally observed in April, but the writer has observed them in June, in which month a butcher sold 25 pounds spoiled sausages, of which some were eaten; illness immediately followed. This should be prohibited by rigid legislation. It is as dangerous to be attacked by a putrid sausage as by a loaded shotgun.

The symptoms of sausage poisoning are pain in the stomach, vomiting, diarrhœa, dryness of mouth and nose, profound depression, cold limbs, frequent fainting, perhaps death. Sausages are usually so heavily salted and spiced that slight putrefaction is not detected. Besides they are generally eaten raw, or but partly cooked. Meat that is unfit for other use is made into sausages. Letheby says that (1860) a forequarter of a beef cow was purchased by a sausage maker, and at once converted into sausage meat; 66 persons ate of the meat, 64 were prostrated with sickness, diarrhœa and great prostration of the vital powers; one died. On examination the meat was found diseased.

There is greater danger of serious illness from eating sausages than from meat, because the knackers can always buy diseased meat or parasitic meat cheap; thus tapeworm, trichina, echinococci, etc., may be carried into the human system, not only from infected meat contained in the envelope, but the gut itself, which is seldom properly prepared, may be the carrier of disease or parasites.

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Diseased Meat.

PARASITES.

The most frequent parasitic disease is trichiniasis (trichina disease), which sometimes follows the ingestion of trichinased pork. The hog is the principal host which harbors these parasites in its body; man is infected by eating trichinous pork. Some other animals, as the rabbit, fox, wolf, etc., are said to be infected, but it is conceded that the rat is the trichina carrier. Rats frequent pigsties, and swine devour them; in this way they may become infected, or the small worm may be expelled with the dejecta of other animals, and be carried into the systems of their host with water or food.

Trichina spiralis occurs in man in the undeveloped and developed states. In the immature state the body is filiform, and has no internal organs besides the intestinal canal, or only rudimentary ones. The mature worm is about 1-30 inch long by 1-700 inch diameter, and is twice or thrice coiled spirally, occupying the voluntary, striated muscular fibres of men and animals, within very small, elliptical, thick-walled capsules, which become calcareous and inclose the worm in a hermit-like cell. When the trichinosed flesh is eaten, the calcareous cyst is rapidly dissolved in the stomach and the worm set free. Finding itself in the midst of nourishing food, it grows rapidly, reaching sexual maturity on the second day; on the sixth day the females bring forth from 500 to 1,000 filamentous embryos. The young immediately set forth on their wanderings, pierce the walls of the stomach and intestines, and migrate into the muscular tissues of all parts of the body. Here they "make themselves at home," and produce lassitude, loss of appetite, and pains, followed by vomiting and diarrhœa; later on fever sets in, which increases in severity, the patient complains of excruciating pains, not unlike those of acute inflammatory rheumatism, fearing to move the limbs, and lying motionless on the back. If death do not carry off the patient, nature may come to the rescue by encapsulating the parasite; then it is harmless.

Trichiniasis is a fatal disease; there is no known remedy that will cure it.

Although discovered by Owen in 1835, trichinæ were considered

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a curiosity until Zanker, of Dresden, discovered the pathology of the disease (1860). How many perished of trichiniasis before this remarkable discovery will never be known, and it required epidemics of the disease, as the "sweating disease," or "black death," such as occurred at Wetzleben in 1849-50, to reveal the presence of parasites as the cause of the mysterious disease.

Among the earliest epidemics in Wurtemberg was that in 1675, the patients partaking of pickled and smoked ham. Many epidemics have occurred since. In Blatenburg, 1859–60–62, sixty were taken sick, two died; in Magdeburg, 1860, 300 sickened, twelve died; in Hettstadt, 1863, 103 sat down to a banquet, nearly all sickened within a few days, and twenty died within the month. The disease was traced to the eating of raw ham and sausages made from an infected pig. The most extensive and fatal epidemic known occurred at Hedersleben, in Germany, 1865, a town of 2,000 inhabitants; 337 of the population were affected and 101 died. The first authentic trichinæ disease in the United States occurred in New York, 1864; one died. In Marion, Ia., 1866, nine persons partook of raw, sliced ham, all sickened and five died. A number of cases have been reported in Michigan, Massachusetts and other states. Trichinosed pork sold a few years ago, in Milwaukee, caused quite an excitement.

Dr. Reinhart states that 39 epidemics, with 1,267 cases of trichiniasis, occurred during the years 1860 to 1875; only a small portion was caused from eating raw pork; one-half occurred after eating smoked sausages, with two deaths; among 340 who partook of well-prepared "Brat-wurste," eight died. Dr. George Sutton, of Aurora, Indiana, states that from three to sixteen per cent. of the hogs killed in Southeastern Indiana are infested with trichinæ. Out of 1,250 American hams imported at Heilbroun, eight per cent. were found trichinosed.

Can trichinæ be detected? Yes; with a good microscope, sometimes with the naked eye. A small slice of the parasitic flesh is immersed, for a short time, in a solution of caustic potash (1–8) to clear up the muscle; the cyst may be better brought out by touching it with muriatic acid. Care should be taken not to confound

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trichina cysts with "psorosperums" or "Rainey's capsules." Cameron estimates that he found 250 trichinæ in a piece of tongue weighing only ten grains; and Prof. Dalton believes that, in a specimen examined by him, there were 85,000 in a cubic inch of muscle. Trichinæ are most found in the muscles of pigs' eyes, and in the diaphragm; in Germany the eye is always examined by the inspector. How can trichinæ be destroyed? By thoroughly cooking the meat. Salting and smoking does not affect them. Mosler found them alive in a ham kept for ten months.

How can trichiniasis be avoided? By abstaining from all raw meat and sausage. If the Germans ate less "Westphaler schinken," or "Servalet," or "Metwurst," the epidemics would be very rare indeed.

Pig sties should be kept clean; rats destroyed if they infest the habitation of swine; hogs should not be fed with offal from other hogs or slaughter house refuse, nor with other pigs' flesh.

Cysticercus cellulosa are small parasites with hooklets inclosed in bladders, scattered through all parts of the pig, but are most numerous beneath the skin, under which they produce small elevations called "measle moulds." The disease has been popularly called "measles," "measly pork," which was first mentioned by Aristophanes and known to Aristotle. They migrate, in man, in two ways from the intestinal canal; either piercing their way through the soft parts, or get into the circulation. Their migration may cause illness and pain; there is no danger unless they get into a sensitive or vital part, as, the eye, brain, spinal cord, heart, liver, etc. Greissinger states that they may give rise to insanity when lodged in the brain.

The infection with cysticerci — as found in swine — in case of man, is extremely rare in this country. In Europe it is found in the lower, filthy classes.

They more frequently give rise *taenia solium*, a species of tapeworm, ten or more feet long! When the segments of these are discharged with the human excreta, they are eaten by the hogs, and, according to Leuckhart, in a few days a certain number of the ova become developed into cysticerci (about one in 1,340).

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This parasite forms for itself a cyst or bladder, filled with clear, serous fluid, from $\frac{1}{8}$ to $\frac{1}{2}$ inch in length. The whole process of development lasts from 2 to 3 months. The cyst becomes surrounded with a cellular capsule, except, sometimes, in the brain. If undisturbed the animal may live in this form from 3 to 6 years, then it dies, undergoes fatty degeneration, and the soft parts are absorbed, leaving a chalky concretion in which, according to Stich, the characteristic hooklets of the larva are found. There is no remedy known for them.

A hog infected with cysticerci has broad shoulders, narrow loins and thickened neck; there may be hoarseness, difficult breathing and lameness; the inner eyelids are inflamed, and there is a yellow spot in the inner angles of the eyes, and "measle moulds" on the skin. The creature lives in the hog, as in man, from 3 to 6 years. In Germany and France the inspectors always examine the inner surface of the eyelids and the under surface of the tongue, where it is always found. The only safe way for destruction of these parasites is thorough cooking at 192° F. (Flint); thorough salting only destroys those near the surface. It is stated that cysticerci have been found alive in melted lard.

All "measly" pork should be condemned and destroyed.

A species of tapeworm is also found in man, and sometimes acquires a length of 60 feet or more; the writer saw one 123 feet long! They resemble taenia solium so much in appearance, that they were mistaken for one another until Kuechenmeister, 1852, pointed out the difference. They are the mature parasite of *cysticercus tænia mediocancellat.*, which is only found in beef and veal. Numerous cases of their occurrence have been reported in Russia and Abyssinia, where large quantities of raw beef are consumed. Dr. Leidy has reported a case occurring in Philadelphia, following the use of raw beef sausage. Dr. Larabee related another case to the writer, and many cases have been reported from feeding raw beef to children.

The cyst is similar to cysticercus cellulosa, but smaller, and difficult of detection.

Taenia ecchinococcus, hydatid disease, is a most dangerous para-

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sitic disease. It is found in the monkey, ox, cow, sheep, hare, etc., and very frequently in dogs, being most frequent in countries where large numbers of dogs are kept, and where they are used in herding sheep. Dogs, cats and wolves eat the offal of sheep and become infected with the corresponding tapeworm. The larva when ingested is set free, the tapeworm forms in the dog's intestines, its segments are cast off with the excreta, and, somehow, find their way (possibly by contaminated water) into the intestinal tract of man, and are, in turn, again produced in the larval form, consisting of a series of cysts, one within another, sometimes singly, frequently in larger numbers, forming hydatids of the liver, lung, brain, spinal cord, eyes, and other organs. They multiply by endogenesis — one cyst growing within another — and the parent cyst may attain the size of a man's head (Trousseau).

Hydatid disease is infrequent in this country, but common and fatal in Iceland. The cysticercus itself is one two-hundredth inch and the corresponding tapeworm one-fourth inch long (Beale). The symptoms in man depend on the organ infested.

There is no cure if the cyst cannot be reached by the aspirator or by the surgeon's knife.

Liver flukes are found in the livers of sheep affected with the "rot." Animals infected with this parasite yield inferior meat. They are rarely, if ever, found in man.

ACUTE INFECTIOUS OR CONTAGIOUS DISEASES.

Pleuro-pneumonia affects only cattle. There are two distinct diseases, one is similar to that of man and non-contagious; the other a highly contagious and fatal malady, which destroys large herds of cattle in Europe and this country, and probably destroys more animals than any other known disease. Both in Europe and this country, it has been proven that thousands of cattle, sick or dead of this disease, find their way to the butcher's block and are sold as sound beef. Some assert that this beef has been freely used as food without dangerous results following; on the other hand, many cases of illness and even death have been reported from its use. Dr. Livingstone states that he has seen both Euro-

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peans and natives — in Africa — severely ill after partaking of the flesh of cattle, so slightly sick with pleuro-pneumonia, that the disease was scarcely noticeable and the flesh apparently sound. That carbuncles prostrated them, and if the use of the meat was persisted in, death followed; and that thorough cooking did not destroy the poisonous virus! Since the importation of pleuro-pneumonia into England from Holland, in 1842, the death-rate increased from 1 to 6.2 per 10,000 from carbuncle; and from 2.5 to 8.1 per 10,000 from phlegmon and boils in five years.

The symptoms of pleuro-pneumonia in cattle are: Shivering, increased, full pulse, cough, increase of temperature to 105° F. or more; later on, the pulse becomes weak and indistinct. There are loud respiratory murmurs, and the nasal cartilages rise spasmodically; the eyes become bloodshot; foam issues from the mouth; pressure on the spine causes pain; friction sounds and bronchitic rales are distinct; there may be diarrhœa. In coughing, calves will stretch the head on a level with the neck. The post mortem appearances are marked: Extensive pleuritic adhesions; false membranes in the trachea; sometimes there are large abscesses in the lungs; the lungs are enormously enlarged — sometimes weighing seventy pounds; Cameron found them weighing 100 pounds in one case — and hepatized. A day after death, it is difficult to detect this diseased from healthy flesh; but it is alkaline to test paper (Letheby). When this meat is hung up in an ice box near healthy meat, the latter soon decays.

Anthrax, malignant erysipelas, renders the flesh of animals so diseased dangerous. Menschel has reported cases of serious illness, and Simon relates the case of a family of nine persons who partook of the flesh of a bullock killed in a low stage of the disease; two died.

Charbon — carbuncular disease — is so dangerous that Prof. Cressy, of Amherst, advises destruction of the whole carcass, including the hide.

Dr. M. Petry, in a communication to the Belgian Royal Academy of Medicine — 1872 — refers to the frequent production of carbuncular diseases from the use of diseased flesh, and gives the history

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of an outbreak of malignant pustule among the inhabitants of Condroz, which was traced to the consumption of diseased flesh of an ox affected with charbon.

Rinderpest is a disease of cattle in the Russian steppe region, and has not yet appeared in this country. Parent Duchatelet states that large quantities of so diseased meat were consumed in France without any bad effects. Pappenheim asserts that there is no danger in using the flesh for food, and Bruecke, of Vienna, says that the Bohemian peasants dug up, cooked and ate such meat after it had been condemned and buried, without ill results, but Dr. Letheby says "it would be very dangerous to permit the unrestricted sale of such meat in all stages of the disease." It is also declared unwholesome by the Belgian Academy.

"Braxy" mutton has been used without ill results when salted and kept for a long time.

The flesh of cattle, suffering from *splenic apoplexy* appears to be damaged but little, yet dogs and pigs die from eating the meat, although thoroughly cooked. Many cases of serious illness, in man, are reported, from partaking of this diseased meat. Splenic apoplexy is evidently another form of anthrax.

Spanish fever, or the *Texas cattle plague*, is an American fever which has destroyed large herds of cattle time and again. It is said to be in a chronic form until the cattle are brought up north, when the acute (epidemic) form is developed. Prof. Gamgee says: "I unhesitatingly asserted, which I repeat now, that the meat is not poisonous, and is incapable of injuring human beings." But the New York Board of Health attribute the increased mortality from diarrhœal disorders and the suddenness of death to meat used from cattle affected with Spanish fever (splenic fever). Dr. E. Harris says: * * * "It must be here stated that no medical officer presumed that the Texas cattle plague would reproduce itself in the human family. But it must be believed that the rapidly and utterly putrefactive effect of the disease in the fatal stages of it clearly pronounces upon the unfitness of such dying cattle for food." "Who would knowingly eat the beef of cattle with such pestiferous breath as these sick Texas cattle have?"

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Diseased Meat.

Hog cholera occurs in swine. It is stated that the flesh derived from the sick has produced no ill effects when used. But the flesh of cholera-diseased or dead hogs should always be condemned, as is done in Germany. Thousands of hogs in the dying stage, or dead, of this disease, are sent to rendering establishments, and the fat derived from them is sold as a pure article of lard. The writer has also heard of instances where such diseased flesh was offered for sale.

"With the *small-pox* of sheep it is different. The flesh of the affected animal is pale, moist, emitting a nauseous odor, and almost immediately giving rise to sickness in people who eat it."

Glanders and *farcy* are diseases of the horse, ass and mule; they are eminently contagious to animals and to man. Decroix states that he has seen hundreds of glandered horses devoured during the siege of Paris, and has eaten of such meat himself without evil consequences. Thousands of horses are slaughtered annually in France and Germany, but it is doubtful that the equine race will ever be killed for food in this country. Americans prefer to kill their horses on the race course.

Medicines administered to cattle locally or internally may be found in flesh after death; and arsenic and antimony, though applied locally, have produced dangerous symptoms in those who partook of the flesh. "Three hundred and one persons once ate of the meat of an ox that had taken two ounces of tartar emetic before being slaughtered; of these 107 suffered from vomiting and purging—one died. Antimony was found in the tissues of the ox, and in the stomach of the man who died." (Kreutzer.)

Pappenheim states that the feeding of swine with putrid animal matter produces poisonous food, and Parkes has remarked that the pork of hogs that had been fed on offal, not always fresh, produced diarrhœa among the soldiers.

CONDEMNED MEAT.

Here we give a few items of the quantity of meat condemned for a certain time and in a few places; the amount is simply enormous.

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Diseased Meat.

In London about 30 to 35 tons of meat are condemned daily.

In Washington during six months there were condemned: 6 cattle, 8 sheep, 11 calves, 1 hog, 7 tons of meat.

The value of meat condemned in Cincinnati for 1874-5-6-8-9 is $67,087.28.

Pittsburg condemned 1876, 10,095 lbs. meat and fish, etc.

Chicago condemned in 1870-1-2-3, 693 qrs. beef, 215 carcasses mutton, 76 calves, 95 hogs, etc.; in 1874-5, more than half a million pounds of meat and fish. In 1877 the total weight of all condemned meat was 177,789 lbs, and in 1878 there was condemned during the year 243,086 lbs.

How much meat is condemned in this state outside of Milwaukee? None! Yet cattle, sheep and hogs are often brought to market in a deplorable condition, and in cities as large as Fond du Lac, *putrid* meat has been sold from the butcher's block, and in a *village* as small as Brownsville putrid sausages (25 lbs.) were sold by a Mayville butcher. The writer has sent back to the butcher's shop putrid meat more than once while he resided in Theresa, and there are no doubt thousands who have had similar observations.

PROTECTION AGAINST DISEASED OR TAINTED MEAT.

1. Hitherto no meat has been inspected anywhere in this state, excepting a few cities, nor have animals, intended for slaughter, been visited and examined by an inspector.

2. An act should be passed regulating the slaughtering establishments, and butcher shops, through some competent inspector, appointed according to law, and such a law should be rigidly enforced. It should prescribe the duties of said inspectors, regulate the fine and costs of offense against the public health, and define the kinds of meat, tainted or diseased, forbidden to be offered for sale at any time or place. The penalty should be heavy.

3. All tainted, putrid or diseased meat offered for sale, as food, should be condemned and destroyed.

4. Calves and lambs under a certain age (at least 4 to 5 weeks) should not be allowed as food, and any such young meat offered for sale should be unequivocally condemned.

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Diseased Meat.

5. We have alluded to the dangers resulting from tainted, diseased, putrid meat, or flesh filled with parasites; any person offering to barter, sell or exchange such meat, however cheap, should be prosecuted for a misdemeanor, and compelled to pay fine and costs of prosecution, and the meat should be confiscated and destroyed.

6. The feeding of animals for slaughter, with putrid materials or offal, should be rigorously prohibited.

7. The running or chasing of cattle within 24 hours before slaughter should be prohibited by law; and persons offering the carcasses or flesh of parturient cattle should be heavily fined.

8. Live stock should be carefully inspected for acute diseases, chronic diseases and parasitic infection, and in doubtful cases the meat should be carefully examined under the microscope.

9. No person should patronize any vendor of meat who does not keep pure and sound flesh for food; or who keeps his slaughter house and butcher shop in an unclean or filthy condition.

Sections 4599, 4600, 4605, and 4608 of the Revised Statutes are all in force, and, with chapter 57, are sufficient to cover many of the above suggestions.

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KEROSENE.

BY J. T. REEVE, M. D., OF APPLETON.

[NOTE.—The following paper has been written for this report at the request of the board. It does not profess to present anything especially new, but aims to give such facts as are of general interest concerning an article of almost universal use, and one upon which, outside of the larger cities, the people are almost entirely dependent for light-giving purposes.

Appended to the paper are some suggestions concerning the preparation necessary for the most satisfactory use of high test oils, and hints looking to the greatest degree of safety to be obtained in the use of any oil.]

That an artificial light is a necessity of human life is a statement that needs no argument, and there exists neither record nor tradition of a time when there has not been some means of obtaining it. Bearing a part in advancing civilization, in developing its industries, and in advancing its comforts that is wholly beyond the power of computation. the search for that material which would be best fitted for light-giving purposes has taxed the inventive genius of man in all ages, and the whole range of the animal and vegetable kingdoms seem well nigh to have been exhausted in this search. It would be interesting to trace, so far as it would be possible to do so, the history of all the efforts made in this direction back until they should be lost in antiquity; to note the successive steps of progress from the burning brand or resinous torch of our forefathers to the electric light of to-day; but the purpose and plan of the present paper is a much more modest one, its aim being to give simply and briefly some of the most prominent and interesting facts in the history and utilization of one of the most abundant of natural productions, which, within the latter half of the present century, has practically superseded nearly all other illuminating agents, and which has completely revolutionized the methods of illumination throughout the civilized world.

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Kerosene.

Accustomed as we are to the daily use of the fluid known as kerosene, which possesses unsurpassed qualities of convenience as an illuminant and which is furnished in our day at such insignificant cost that the blessing of a brilliant light may be had even in the dwelling of the poorest, it is difficult for us to understand how it was that the existence and general properties of the petroleum from which it is derived should have been so long known without appreciation of its value and importance. It is, however, an unquestionable fact that springs and fountains furnishing petroleum were known and used to some extent for illuminating purposes centuries before the Christian era, and "the perpetual fires that burned at Pagan shrines" are supposed to have been produced by this material ignited at the surface of some such natural source. The "perpetuity" of such fires may be easily comprehended when it is known that one petroleum spring[1] of historic mention has flowed continuously for over two thousand years. In later days the ignition of petroleum upon the ground or upon the surface of some pond or stream, upon which it was floating, seems to have been of frequent occurrence, and it is in connection with such ignition during the course of certain Indian ceremonies that mention of it is first made in American history. This was only about one hundred and thirty years ago, but we have evidence that petroleum was collected in pits or wells for some purpose at a much earlier date. These receptacles "which are known from the trees now growing upon the earth thrown out in making them or growing in the wells themselves, to be from five hundred to one thousand years old,[2]" are supposed to have been the work of that mysterious race known as the Mound Builders, but for what purposes the petroleum thus collected was used we can only conjecture.

Efforts to purify this crude material, however numerous they may have been, were not crowned with any measure of success until a very recent date; hence, when petroleum was accidentally obtained in drilling a salt well in Ohio in 1819, or ten years later under similar circumstances in Kentucky, not only was the immense value of the discovery overlooked, but the finding of the oil instead of

[1] In the Island of Zante. [2] Prof. Chandler.

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the salt water which was desired was regarded as a great disappointment, the only use then known for petroleum being as a medicine, and the demand for it for that purpose being extremely small. Yet so close were they, even then, to a knowledge of the real importance of the substance that Dr. Hildreth, writing in 1826, said of it: "It is beginning to be in demand for lamps in workshops and manufactories. It affords a clear, brisk light when burned in this way, and will be a valuable article for lighting the future cities of Ohio." A third of a century, however, passed after the utterance of this prophecy before further progress was made; now, kerosene, the chief product of its subject, is to be found in every part of the world to which civilization has extended. Probably more than a million of the citizens of this state alone are entirely dependent upon it for lighting their homes, yet, as a recent writer has very truly said: "it is doubtful if there is another article under the sun that exerts as much influence in the civilized world; is so freely handled and so little understood, as kerosene."

Petroleum, sometimes called rock oil or coal oil, because an illuminating oil of similar properties was formerly obtained from certain kinds of stone or coal is, as has been said, one of the most abundant of natural productions. Formed in some not well understood manner in nature's great underground chemical laboratory, where, according to one of the most recent and most plausible theories, it is constantly being produced, it frequently rises to the surface of the ground either as an exudation or as a spring, from which considerable quantities may float out upon the surface of some stream or lake, or collect in low places or cavities upon the ground. Experiment, stimulated by the facts that illuminating oils were being profitably manufactured by the destructive distillation of certain kinds of bituminous coal, and that these oils bore a strong resemblance, before being purified, to the crude petroleum, finally showed that this material could be so refined as to make a satisfactory illuminant; a strong impetus was thus given to its collection at places where it appeared upon the surface, and large quantities were thence obtained by the clumsy process of absorption by blankets, which, when saturated, were wrung out into tubs or

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Kerosene.

similar receptacles. The demand for it being an increasing one, Col. G. L. Drake, whose name is inseparably connected with the development of the petroleum industry, conceived the idea of sinking an Artesian well in the oil region for the purpose of obtaining oil; this project, which was regarded by his friends and neighbors as foolish or insane, was, nevertheless, carried into execution in 1859, the very first effort being entirely successful. Oil was struck at the depth of only seventy-one feet, and flowed at the rate of from four hundred to one thousand gallons per day, its value at that time being about sixty cents per gallon.

"From that moment the scene changes as if by magic." The declaration of the patriarch Job, that

'The rock poured me out rivers of oil,"

was literally verified, and an era of excitiment, scarcely equalled in its intensity, even in the search for gold, was at once inaugurated. "Hillside and valley are stripped of covering; log-house and shanty grow up over night; hand and machine are busy to tap the earth of its liquid treasure. A forest of derricks is seen where but yesterday was a forest of trees; all is working, drilling, pumping, collecting, shipping." The drill of Col. Drake's well, the first of its kind in the world, struck a vein of oil on the 28th of August, 1859. Before the year ended, more than two hundred oil wells had been sunk and were in operation. In twenty years from that date, more than twenty thousand such wells had been sunk and more than ten thousand were in operation in Pennsylvania alone.[1]

In 1860 the product of these wells was given at five hundred thousand barrels; in 1870 it had risen to over five million barrels, and the present yearly product is more than fifteen million barrels. Refined petroleum now ranks as the fourth in value of our export commodities, the oil exported during the last eighteen years being worth $562,992,645. How much in addition to this has been necessary for home consumption there is no means of knowing, but the amount required is estimated at nearly five millions of barrels

[1] These statistics are given on the authority of Prof. Schweitzer, of the University of Missouri.

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annually. The average daily production in this country is now about seventy thousand barrels.[1] There seems practically no limit to the production of petroleum, for, while this enormous quantity has been procured in the United States, and chiefly in a limited region in Pennsylvania and New York, the product of other portions of the world is also immense and is constantly increasing as new fields open for its consumption and new uses are found for such of its constituents as are unfit for illuminating purposes. We are indeed appalled at the thought of the calamity which would befall the world should the production of petroleum fail in coming years, for, not only has it proven vastly superior as an illuminant to any of the materials which it has displaced but it is furnished at a price that is trifling as compared with that of any substitute as yet known or even thought of; the present prospect, however, is rather that of over-production and consequent cheapening than of any diminution and resulting increase in price.

CRUDE PETROLEUM

as obtained from its natural sources, is a substance differing considerably in character as obtained in different localities, and in all very different in appearance and qualities from the refined petroleum of commerce and home consumption. It is fitted for use by a process of distillation, the crude oil being placed in immense iron stills, which hold from a few hundred to 2,000 or 3,000 barrels; in these it is subjected to a carefully regulated degree of heat by which it is converted into a vapor which is afterwards collected and condensed into the liquid form, this liquid at different stages of the process being conducted into separate receivers at the pleasure of the refiner. The contents of these several receivers thus arbitra-

[1] During the year ending June 30, 1880, there were exported from the United States 423,691,767 gallons of petroleum products, valued at $36,221,066, of which 367,325,123 gallons, valued at $31,783,575, were classed as illuminating oils. These exports in the aggregate exceeded those for the year ending June 30, 1879, by more than 45,000,000 gallons, though owing to the cheapening of the product, they were valued at over $4,000,000 less in 1880 than in 1879.

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rily separated, though differing widely in characteristics, are capable of intermixture to any extent and differ but little from each other in chemical composition, all of them being compounds of carbon and hydrogen in varying proportions. Chemists recognize a vast number of these substances as being present in petroleum, both in its crude and refined states, but very few of them are of sufficient general interest to demand consideration here.

A very moderate degree of heat in this refining process suffices to vaporize the lighter constituents of crude petroleum, the lightest of all, indeed, taking the form of vapor at ordinary atmospheric temperatures, while the vaporization of the heavier portions requires the application of a very great heat; and a small tarry residue remains at last which cannot be volatilized at all, and is found in the stills on the completion of the process. The earliest commercial products of this distillation are known as gasolene, benzine and naphthas of various grades, all of which are found in the markets and some of which will be more particularly mentioned hereafter.

The value of petroleum lies chiefly in that portion of it which, in the process of refining, gives the largest amount of its bulk in those constituents which constitute the refined petroleum of commerce and of domestic use popularly known as

KEROSENE,

a name first adopted as a trade mark for an illuminating oil manufactured from coal, limited quantities of which were in use before the discovery of the vast petroleum fields already mentioned.

Kerosene then is simply that portion of petroleum which comes from the still during the middle part of the refining process, excluding both the lighter, which are first distilled and too volatile to burn with safety, and the heavier portions which are not satisfactory illuminants, but make very good lubricators. In other words, it is the central part — the heart of the distillation, which is subsequently purified by washing with dilute acids, with alkalies and water. Just how large a proportion of the whole distillate shall be run into the kerosene tank is entirely within the control of the refiner, who

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is governed in the matter not by any perceptible change in the appearance of his product, but by its specific gravity or weight, and, as kerosene is the one product of chief value in the whole process, it is plain that it is to the pecuniary advantage of the manufacturer to make the percentage of kerosene the largest possible.[1]

The refiner is, therefore, always under the strong temptation to allow a little of the naphtha at the one end of his distillation and a little of the heavier oils at the other end to run into his kerosene tank, neither of these additions being for the advantage of the consumer. In those establishments which refine thousands of barrels daily, the addition of a comparatively small percentage of these cheaper and inferior constituents will make an enormous addition to the profits, but such profit to the refiner, or to the dishonest dealer who may subsequently adulterate that which has left the refinery, is gained at the cost of those qualities which make kerosene a safe and desirable illuminant.

The fact that such adulteration can be accomplished without the possibility of detection by the consumer furnishes at once the reason and the demand for such authorized municipal or state inspection as shall protect the people from a fraud that affects not simply the cost of the article, but which also endangers inevitably the safety of life and property. Gradually the necessity for such inspection is coming to be generally understood, and state after state is being added to the list of those which have by legislation taken the wise and humane ground recently occupied by our own state, that traffic in this illuminating agent shall be subject to certain specified restrictions, and that all kerosene offered for sale must be able to pass certain specified tests. Progress in this direction has not, however, been made with sufficient rapidity, nor are the regulations as stringent as the importance of the subject de-

[1] NOTE.—Just here a hint may be given to those who desire the best article that can be had, that the very choicest oils in any given grade are those known as "Water White" which, so to speak, form the heart of the refining process and which, though somewhat more costly, are always the best illuminants; these oils are, as their name indicates, free from all color and as clear as water.

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Kerosene.

mands, it being still possible to sell in many states some of the lightest products of petroleum, such as gasolene and naphtha, for illuminating purposes; these are seldom offered, it is true, under their proper names, but with such deceptive titles as

NON-EXPLOSIVE BURNING FLUID,

Water Gas, *Centennial Illuminating Oil*, *Petrolene*, *Aurora Oil*, *Liquid Gas*, *Anchor Oil*, *Hyperion*, *Safety Gas*, *Sunlight Burning Fluid*, *Carbolite*, *Carbon Fluid*, *French Burning Oil*, *Septoline*, *Rose Oil*, etc., under some one of which delusive names, here one and there another, the unwary are entrapped into their use to their own destruction. It is usual in all these cases to add to the gasolene or naphtha, which forms almost the entire bulk of the fluid, some other article or articles which it is claimed improves it, and renders it "entirely safe in use." As a matter of fact, these additions are simply made for the purpose of deceiving; and the danger inseparable from any use of the chief constituent is in no degree diminished by the addition of any one, or all of them, singly or combined. All of these fluids are unsafe as illuminants, under any circumstances; all are explosive; tremendously so under certain conditions, which, it may be, occur rarely, but which may occur with any one and at any time. A very great danger, perhaps the most important one, lies in the immense inflammability of all these fluids. They will take fire at any ordinary temperature on the application of a flame, and many of them give off inflammable vapors with such rapidity that a flame need not be brought into actual contact with them at all, but will communicate itself to them very readily at the distance of several inches. The sellers of these death-dealing substances are in the habit of performing certain attractive but extremely delusive experiments to demonstrate their "safety," such, for instance, as removing the top of a lamp partially filled with one of them, and setting fire to the escaping vapor; pouring the fluid from a can through the flame so produced, thus showing, as they claim, and too often induce their hearers to believe, that "there can be no explosion!" No explosion is possible under such circumstances, for explosions occur

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only when the vapor of an oil becomes mixed with atmospheric air in certain definite proportions, in a confined space, as in the body of a lamp. If the fluid is so volatile that its vapor is given off with rapidity sufficient to *fill the lamp immediately*, and expel the atmospheric air, which is done in these experiments, the vapor simply burns quietly and harmlessly; if, however, a lamp in which such oil is burning should be accidentally broken, and its contents spilled, ignition is certain to follow and to spread instantaneously over the full extent of the surface of the fluid, bringing torture or death and destruction to all in its vicinity; from the nature of things, generally women and helpless children are the victims, and such results happen with all low test oils, in proportion to their volatility.[1] On the other hand, with a properly purified oil of high test, the chances of explosion are almost infinitely lessened; such an oil volatilizes and takes fire so slowly that, under similar circumstances, with ordinary presence of mind, nearly all chance of danger may be avoided, while an incipient conflagration can be at once arrested. This has been very thoroughly demonstrated in this state on several occasions within the writer's knowledge during the present year; lamps in which legal test oil was burning have been upset and broken, with no resulting injury greater than a soiled carpet, the physical certainty being that, had low test oils been used in these instances, conflagrations and loss of life would have occurred. With such happy results, the people of Wisconsin may well be congratulated upon the degree of safety secured by the inspection law of 1880.[2]

It is very true that all kerosene accidents cannot be attributed to

[1] The vapors, moreover, mingling under such circumstances with the air of the room, may, and often do form a true explosive mixture, to which, flame being communicated, are due the horrible concomitants often observed in connection with kerosene lamp explosions.

[2] The requirements of this law are, that no oil shall be sold or used that will emit an inflammable vapor at any temperature below that of 120 degrees, and that the oil must not thicken when exposed for ten minutes to a temperature twelve degrees below the freezing point; and that the character of all oils offered for sale in the state must be certified to by inspectors duly appointed by the state.

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the inferiority of the oil used, and that accidents will undoubtedly happen with really good — such as in ordinary circumstances may be called safe — oils; still the great preponderance of such accidents where low grade oils are used is surely an ample justification of state inspection, and for prohibiting the sale and use of all oils below a certain grade, for, however strong the presumption that carelessness is the cause of any or every accident, we must remember that the world is likely to contain careless people for a long time yet to come, and that legislation will be long needed to protect them and their careful neighbors from the consequences of their acts; when they cease to exist, but not until then, will it be prudent to allow the general use of low test kerosene, or naphtha, or gasolene, without resorting to deceptive names to conceal their character; then also will it be safe to permit the unrestricted use and handling of gunpowder and nitro-glycerine, carelessness in the use of which is far less destructive, in the aggregate, of life and property than low-test kerosene which in the twelve years from 1866 to 1878 is estimated to have caused the death of thirty thousand persons, and destruction of property to the amount of twenty millions of dollars.[1] Such figures are startling, but we seldom appreciate the extent of injury done by occurrences that happen so unobtrusively — here and there a case which furnishes an item in the newspapers and is then forgotten.

The characteristics of good kerosene are so well described in a lecture delivered by Prof. Schweitzer, of the University of Missouri, that his account is here transcribed as follows:

"A good kerosene should be:

1. Safe, that is to say, not readily inflammable.
2. Odorless, i. e., not possessing a disagreeable odor.
3. Clean, i. e., not creeping over.
4. Pure, i. e., not encrusting the wick.
5. Light, i. e., not having too high a specific gravity.
6. Colorless.
7. Cheap."

[1] These figures are given on the authority of the *Petroleum World* and refer to the United States alone.

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Kerosene.

Safety, it will be noticed, is here placed *first* in consideration; cheapness, very properly last.

Since the safety of an oil depends chiefly upon the test which it will bear, the question naturally arises, why not increase that test until a standard of absolute safety is secured? This can undoubtedly be done — that is, an oil can be secured of so high a test that it will not take fire more readily than the old-fashioned whale oil, remembered by many as the light of their younger days, and such oil in suitable lamps and with proper wicks can be made to burn satisfactorily; indeed, some of the most highly-esteemed oils are of very high test — those known as Mineral Seal and Mineral Sperm oils, for example, may be heated far above the boiling point of water, and will then put out a flame as readily and certainly as water will, and yet, when burned in suitable lamps, those having Argand burners and oil-reservoirs properly arranged, will give a brilliant white light of great purity and softness, and having very high illuminating powers. Says Prof. Kedzie, speaking of one of these: "It gives an excellent light for students — so soft, steady and so little fatiguing to the eyes, that I constantly use it in my study lamp." Such an oil is even safer in use than candles; its employment is compulsory on some steamboats. Other oils, that will bear tests much more severe than those required by our state law, are in common use and high esteem in some localities where a high degree of safety is specially desirable. But there is a limit beyond which it is not wise to go in legislation; such oils are more expensive, and require more than ordinary care in management; they are not well adapted, moreover, for burning in such lamps as are commonly found in our houses and markets, nearly all of which have burners fitted for the use of the more volatile and lower grades of oil — the same thing being true of the lamp-wicks, those usually to be purchased not being adapted to the use of a high grade, heavy oil. The function of the wick is to draw up the oil by means of capillary attraction to the top of the wick-tube, where it is to be burned; when the wick is capable of doing this duty, we shall have a good light even when we have a heavy oil; but if the wick be of too close a texture, as is very frequently the case, it fails to perform

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its work, becomes dry and charred, and as a consequence the light grows dim and may go out. Thus, failure to adapt our lamps and wicks to the proper conditions often brings into disrepute an oil which, while being all that can reasonably be expected for safety, is at the same time capable, if rightly handled, of being made a most excellent illuminator. Time and a certain amount of practice are necessary to secure the best conditions, especially where a community has been long accustomed to the use of oils of very low grade.

From a lack of the knowledge above referred to, have doubtless arisen some complaints of the burning and illuminating qualities of the present Wisconsin legal test oil, but it is quite certain that such complaints will disappear upon the adoption of such changes in lamps, burners and wicks as are entirely practicable; the importance of this matter is such as to render excuse or apology for its full discussion unnecessary. The present "Wisconsin legal test" oil is simply an oil having a flash test of 120° Fah., which is equivalent to a fire test of about 160°, and such oils, or those of far higher test, can, as has already been shown, be burned with a very high degree of satisfaction, provided that the oil, the lamp, and the wick are properly adjusted to each other. Prior to the enactment of the existing law carefully conducted experiments were made with a large number of samples of kerosene obtained from all parts of the state; these investigations proved that a very large amount of oil fraudulently branded as having a test of from 110° to 150° Fah., but the real test of which was from 70° to 90°, or even lower, was being sold and used by our citizens without suspicion of the danger to which they were exposed and which will always exist in the absence of any law. Such oils will burn freely in almost any kind of lamp and with almost any sort of wick, no matter how closely woven and no matter how great the distance between the oil reservoir and the flame — indeed, so far as concerns safety, the greater such distance the better — with oils of greater specific gravity, the wick must be loosely woven and the oil reservoir should be broad and shallow; thus, the surface of the oil being always near the top of the wick tube, and the wick having sufficient capillary

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force, we shall have a good, as well as a safe light; with any form of lamp and with any oil, the chimney and burner should be kept well cleaned and in good order generally.

As it is highly desirable to encourage the general introduction and use of kerosene of even higher grades than that recognized as the standard by the law of the state, and as the needful preparations for the use of such oils are not sufficiently understood, a few general suggestions are appended, which, if observed, will remove the objection which is likely to arise if the attempt be made to burn them without such preparation, to wit, that they are not satisfactory as illuminants:

1. Get the *best* oil, for there is a choice between oils, even of those which will bear the same legal tests. Thus, the "water white" oil of any special test is to be preferred to other oil of the same test, and this grade or quality of oil is especially desirable where the test is a very high one.

2. Use lamps with broad, flat reservoirs, so that the oil does not have to be lifted far to reach the place where it is to be burned — that is, to the top of the wick-tube.

3. Get good wicks — those of loosely-woven, open texture, with as few cross threads as practicable. See that the wick fits the wick-tube, but does not fill it so closely that it will not move up and down with perfect ease.

Most of the wicks, in the markets where low-test oils have been commonly sold, are of too close a texture for the satisfactory use of high-test oils. They answer perfectly well for the use of that which is very volatile, but fail to lift heavier oils to the place where they are to be burned. Such wicks may be improved somewhat by pulling out a few of the long threads, but should be abandoned for those of better make. A home-made wick, made of strands of old-fashioned candle wicking, sewn into a flat tube of coarse muslin, will be found to give excellent results with very heavy oils; though a wick thus made is liable to the objection that it will not move up and down in the wick-tube easily. The capillary power of any wick is destroyed by long use, and particularly by disuse, if left standing in oil.

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Kerosene.

4. Keep the brass fittings of the lamp and especially the perforated plate which admits air to the flame, *clean* and free from all deposits of bits of charred wick, burnt matches, films of oil, etc., etc.; select also such burners as will allow the freest draught. Should the plate on which the chimney rests become bent or broken so that the chimney does not rest on it fairly and firmly, the draught may be interfered with or the currents changed, and it should be thrown away and a new burner be substituted. All parts of the burner should be perfect.

5. Get good, well-proportioned chimneys, rather long and narrow than otherwise. The short chimneys with heavy scalloped edge at their tops and which expand widely opposite the point where the flame comes, are especially objectionable.

6. Keep the chimney scrupulously clean; a smoked, dirty chimney, like a ground glass one, will absorb a large proportion of the light. Thus careful experiment has shown that while plain glass, one-sixteenth of an inch in thickness, will absorb about five per cent. of the light, ground glass of the same thickness will absorb over sixty per cent.

And finally, in the interest of safety in the use of kerosene oil of any grade:

7. Fill your lamps daily, and *never when lighted*. Do not fill a lamp by night or by an artificial light, if by any possibility you can avoid doing so.

8. Have all hanging lamps securely hung. All other lamps should have a good, large, heavy base, so that they may not be easily overturned.

9. Turn the wick down before extinguishing the light, but do not turn it far down and leave it burning.

10. Do not blow down the chimney to put a light out; if the wick is turned down, a puff across the top will do it certainly and safely.

11. NEVER USE KEROSENE OF ANY QUALITY FOR LIGHTING THE FIRE.

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Extracts from Special Correspondence.

EXTRACTS
FROM
SPECIAL CORRESPONDENCE.

According to our usual custom, we present such extracts from the special correspondence of this office as appear to be of general interest. In the circular issued for the purpose of obtaining information respecting the general health of the people of the state, certain questions were asked to which specific answers were requested. In response thereto, communications from fifty-five correspondents were received, from many of which full quotations are presented herewith. Such quotations being made, however, there yet remained a large residue of information of value to the board and to the public also, but which could not be utilized in the same way, which has been furnished to us at the cost of, at least, the time of the writers, very often of no small value,— information which it seemed should be given to the people, both as containing knowledge important for them to have, and as a matter of courtesy to the gentlemen who have been at the trouble of forwarding it.

The circular above mentioned is given in full elsewhere in this report. In addition to the correspondents whose replies thereto are here given, communications have been received from the following gentlemen: J. E. Bacon, M. D., Waukesha; A. W. Bickford, M. D., Richland Centre; G. A. Bodenstab, M. D., Fountain City; F. W. Devoe, M. D., Wausau; W. H. Earle, M. D. Wrightstown; L. Eidemiller, M. D., New Cassel; E. Ellis, M. D., Ashland; D. R. Freeman, M. D., Colfax; C. A. Guenther, M. D., Franklin; R. E. Glover, M. D., Bell Centre; C. B. Marshall, M. D., Osceola Mills; J. Massman, M. D., New Holstein; J. Oettiker, M. D., Georgetown; W. H. Oviatt, M. D., Clintonville; H. H. Parrott, M. D.,

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Douglas Centre; J. F. Pritchard, M. D., Manitowoc; D. W. Rector, M. D., East Troy, and D. A. Spencer, M. D., Augusta. It is believed that in this list are embraced all names of correspondents from whom communications have been received in addition to those from which quotations are hereinafter made.

It is the decided opinion of the majority of those who have considered the matter, that there is no ground whatever for any fear that change of climatic conditions in Wisconsin either has produced, or will produce, any marked increase in either pulmonary or malarial diseases; while several of our best and most careful observers admit that consumption has increased to some extent within our boundaries within the past few years, the reasons they assign for such increase, substantially the same as those given by Dr. H. F. Godfrey, in the thoughtful communication quoted at length in the secretary's report, are of a character to relieve our citizens from the apprehension upon this score which many have felt and have expressed. The majority of our correspondents also give it as their opinion that the aggregate amount of sickness in the state is not increasing from year to year, some thinking that it is diminishing, while none think that there is an increase in disease proportionate to the increasing numbers of our population. Quite a number of writers reply to the first, second, fourth and fifth questions proposed in the circular in the negative, adding frequently qualifications, which, however, are not of a character to disturb confidence in the general reputation of Wisconsin as an exceedingly healthful place for permanent residence.

The following are the more important parts of the communications for which, and for the kindly and continued interest shown in our work, we return our sincere thanks.

As hitherto, the extracts are arranged, for greater convenience of reference, in alphabetical order according to the towns from which they come.

Alma.— Dr. G. Seiler writes from this town as follows: There was a somewhat severe epidemic of Diphtheria in this county last fall with a pretty high death rate — forty or fifty per cent. Fountain City is a healthy place; the streets are kept clean and the

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water is excellent, coming mostly from springs, but yet the severity of the disease there was remarkable. In one house where three fatal cases occurred the well was in the cellar — a very bad location.

One case occurred which shows in a pretty strong light the contagious character of the disease: a boy living in a locality where no case of Diphtheria had been observed for three years, began attending the public school; fourteen days thereafter he contracted Diphtheria which assumed a malignant type, and, in spite of the most energetic treatment, he died in three days. His brother, who went to school with him, was also attacked, but the malady in this instance was milder in type and he recovered. Isolation and disinfection of houses, the school house in particular, was practiced to a considerable extent, and when the disease had apparently reached its climax, it suddenly ceased and no further cases occurred.

Belmont. — Dr. B. M. Gill sends the following interesting information: An instructive case of arsenical poisoning occurred here some little time ago. I was called to see a child of three years old, who was vomiting and showing other signs of gastric disturbance; supposing at first that his condition was caused by some improper article of food which he had taken, I treated him upon that hypothesis, but without success. The next day, the gastric difficulty still continuing, although the purging had ceased, I inquired whether the child could by any possibility have had to do with any corrosive substance, or eaten anything poisonous in character. At first such an occurrence was pronounced wholly out of the question, but after much consideration the servant girl remembered that he had washed his face and hands with a piece of green silk, and that a large part of the dye had come off in the operation, leaving him well covered with it. On seeing the silk, which at my request was found and brought to me for inspection, I decided that I had discovered the cause of the sickness, and accordingly changed my treatment with satisfactory results. The next day the eyes were puffy, and the stomach continued irritable for some days thereafter, but the boy finally recovered.

Analysis showed the presence of both copper and arsenic in the

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silk (Scheele's green). I do not think that the poison had been absorbed through the skin, but rather that the child must have swallowed some of it during his washing operations; I should be glad, however, to have the opinion of others on this point.

Whooping Cough and Diphtheria have both appeared in this neighborhood, but careful seclusion has been enforced in every case of either disease, and therefore they have not spread.

Farmers hereabouts have sold to buyers hogs dead from hog cholera, which were shipped to Chicago in the same cars with living, and presumptively healthy, animals. This is undoubtedly a very bad arrangement, and if there be no law already to control it, one should pass very speedily.

Boscobel. — Dr. L. G. Armstrong reports thus: It does seem to me that there are more cases of Phthisis among our people now than there were twenty, or even ten years ago. Certainly the number is very large, and they occur principally among the laboring and middle classes of our population. I am unable to assign any definite cause, but think it may originate in depression of system from malarial disease, never properly *cured* as such.

Last season every one who was sick had chills, but this season chills are not fashionable, while Bilious Fevers, Diarrhœas, Dysenteries and the like are common. We have had no epidemic disease among children for the past two years in this immediate vicinity, but about twelve miles from here Whooping Cough and infantile diarrhœas are quite prevalent.

The Wisconsin was very high early in the summer, and every one predicted a plentiful crop of chills and fever — which had not been produced hitherto.

Brillion. — Dr. I. McComb sends the following brief report: Diphtheria and Typhoid Fever have been more frequent and severe in their occurrence than usual. In my opinion this is due to filth in the surroundings, and the bad sanitary habits of many of the families affected.

Calumet Harbor. — Dr. J. B. Devlin, writing from here, says: Diphtheria was brought here from Fond du Lac by a family living in that city who, having lost two children by the malady, sent the

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Extracts from Special Correspondence.

remainder here; two of these developed the disease shortly after their arrival. Measles also has been rife, introduced from the same locality.

Colfax. — Dr. E. Monteith sends the following instructive statement: Typhoid fever was very prevalent here last winter, some cases being quite malignant. The first of this character appeared in a family where the drinking water was procured from a creek or from a hole dug by the edge of a marsh and called a well. *Nearly every family living on the creek below the point at which this first case occurred had one or more cases of Typhoid Fever*, while those living higher up, or away from the creek, had no trouble. At another place, distant about three miles, lived a family, four of whose members were taken down within three days. Here also the drinking water was taken from a creek where, on examination, I found a rough bridge of poles and brush thrown across, above which the surface of the water was covered with a thick, green, offensive-looking scum. From these cases several other families were infected, but I saw no instance of fever where the drinking water used was good and pure.

Much new land is broken up here every year, and I think that much ill health is due to that fact; still, if more attention were paid to the matter of securing good and pure drinking water and to personal cleanliness, this would be a very healthy section of the state.

Eagle.— Dr. C. B. Bannister reports briefly to the following effect: We have had no epidemic other than a very light visitation of Measles. Most cases of disease of a malarial type that I have seen have been caused by stagnant, putrid water in old cisterns under the houses or by damp cellars not properly cleaned and having walls neither plastered or painted as they should be.

Fond du Lac.— L. R. Lewis, health officer of this city, says: There have been many cases of Diphtheria, the majority of which I attribute to a lack of cleanliness and improper ways of living.

Freedom.— Dr. E. Erb reports from here to the following effect: There has been no increase in pulmonary disease or in any type of malarial trouble, but rather a marked decrease of sickness gen-

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erally, and what few cases do occur are very mild in character. After an epidemic of Scarlet Fever last year, which took on at first a quite virulent form, beginning in the southwestern part of the town and moving along the lines of the main thoroughfares, ceasing with the approach of winter and taking a new start in the spring, but in much milder form, there was a general decrease of zymotic disease. In some few cases of Scarlatina during the season above mentioned there were unusual sequela, but otherwise there was nothing worthy of special notice.

Geneva.— Dr. B. O. Reynolds gives this generally favorable account of this place: Diphtheria, our scourge of last summer, still makes its appearance in isolated families in our village and the surrounding country, but not as last season, in an epidemic form. A few families have been attacked this year that escaped last, and I know of no severe cases occurring this season among those who suffered last summer. Twenty or twenty-five cases, perhaps, all told, will cover all that we have had during the past six months; many were severe and a few fatal. No especial cause has as yet been found to account satisfactorily for its outbreak in any family here.

A few cases of malarial trouble have occurred among the residents of that part of the village bordering on the mill-pond, but I have heard of little, if any, Diphtheria showing itself in that neighborhood. In all other respects we have enjoyed our usual measure of good health.

Hammond. — Dr. E. L. Boothby writes to the following effect: We have had many cases of Diphtheria scattered around in different places. Isolation was insisted upon as far as possible, and no single case has occurred that could be traced to contagion. The houses where the disease occurred were from one to six miles apart and there was no communication between the families who occupied them; I therefore believe the causes to have been entirely local.

Pretty much every house in town has been disinfected and our people's eyes are opened to the fact that *they can stamp out the disease if they try.*

Hazel Green. — Dr. J. L. Jenckes gives the following account:

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Early in April last a man and his wife called at my office and desired me to examine a little child for what they supposed to be some sort of eruption which was then just breaking out upon it. I at once recognized the disease as *Small-Pox*, many of the pustules being fully developed on the face, scalp and limbs. The parents informed me that they had two other children at home suffering from the same disease, none of them having been vaccinated; the father also was just recovering from an attack of Varioloid from which he had been quite ill.

He supposed that he had contracted the disease from a German immigrant family whom he had met some weeks previously in Illinois. He and his family occupied an isolated dwelling some five miles from the village in the northern part of the township; all of them were ordered to confine themselves strictly to the house, which direction was enforced, and no neighbors were allowed to enter, all living in the vicinity were or have been vaccinated, and by these means the disease was confined to the original three or four cases.

Leeds. — From this town Dr. J. Faerber sends this valuable communication: I have observed an increase in cases of Phthisis, but am somewhat at a loss to assign any cause therefor. Our town is an old settled one, few families come into it and our population changes very slowly. I note the development of pulmonary disease mainly among our younger people, and the only hypothesis I can frame is that the conditions prevalent here, atmospheric, climatic, etc., are not so well borne by the children as they were by the parents who came here years ago and went through all the hardships of pioneer life. So far as any change in habits of life has taken place it has been for the better; the sanitary conditions are certainly improved and improving, and better homes and better surroundings generally are found. It may be that the clearing off of all our woods and the consequent loss of any wind-breaks, the exposure of our high, undulating prairie surface to the strong winds which sweep over it in winter, unchecked and untempered at the present time by any forest-land, is to be taken into consideration; but yet one effect of this clearance has certainly been to render the

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country much drier than it was formerly, and I believe that it is now pretty well settled that the drier a soil the more favorable is a location in phthisical difficulties.

We have had epidemics of Measles and Parotidis, which were very obscure in their origin, but were finally traced beyond all doubt to a single district school, by means of which both diseases were very widely distributed. This was proven by the fact that at first each disease was limited to the children attendant upon a given school; e. g., Measles appeared in a certain district and ran its course without affecting the children belonging to a second adjacent district where Mumps was prevalent at the time, the children of the first district remaining, meanwhile, free from that disorder. After a time, however, probably by the transference of scholars from one district to the other, certainly by communication in some way or other between the two, the diseases overlapped, and both appeared in each district. Neither of them was very severe in any locality, and apart from the means of their spread and the method of communication, no interest whatever attached to either of them.

Linden.— Dr. B. W. Gill makes these suggestions, which are worthy of careful consideration; I should be glad to call attention freshly to some points of interest in regard to milk; points which have been suggested to me by my own personal observation, and which I fear have not received the consideration which is due to them. Now that there is so much importance attached to all questions of food and drink, I think it well to have this of milk supply fully discussed, as whenever this is done, the risk of sinning through ignorance becomes less thereafter. We are told to be careful in our selection of milk for children, but it seems to me that a most important direction in which care should be exercised has not been pointed out. Of course we are told that the cows must be milked regularly, the milk received in vessels scrupulously clean and afterward properly cared for and prepared; but this, it seems to me, is not beginning far enough back.

I do not believe that an unexceptionable supply of milk can be obtained from cows that are allowed to run at large, either upon the public highway or in ordinary pastures, and my reasons are as fol-

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lows: Cows may overeat themselves, either when pasturage is rank and abundant or by breaking into grain or other fields — a thing of frequent occurrence even upon the best regulated dairy farms; they may consume noxious weeds from which very undesirable qualities may be imparted to their milk; they may drink from impure sources and thus introduce Typhoid or other similar germs into their own systems directly and into human systems indirectly; they may inhale poisonous effluvia from dead and decaying animal or vegetable matter; they may and do sometimes become overheated from various causes, especially during the breeding season. All these possibilities, probabilities rather, with others that might be mentioned, seem certainly worthy of consideration; I am satisfied for my own part that I have seen children repeatedly who have been rendered sick by the use of milk that from one or more of such causes as those above enumerated was unwholesome.

I should, therefore, suggest that the cows from which milk for household use is taken, and more especially milk intended for a child's nourishment, should be kept in clean, dry, well ventilated, well lighted and well warmed stables, and fed upon a good allowance of timothy and clover hay, with cooked meal and bran, furnished with water of known purity, and let out only to get such exercise as is needful to keep them in high health; and I believe that thus their milk will attain a higher purity and a better quality than is possible under the ordinary management.

I have no doubt that the secretion of milk also serves some excretory purpose in the animal's economy, one evidence of the fact being the rapidity with which onions, carrion, any strongly odorous substance, in short, affects the fluid. I know that many babes have been successfully reared on cows' milk, but I know also that many others have suffered and died under attempts to rear them in the same way, and I believe that a large proportion of this suffering and death may be avoided by the general adoption of the measures above described and advocated.

Lodi.— Dr. G. E. McKeeby reports from here as follows: Diphtheria has prevailed hereabouts more or less during the past year, and for the most part in families occupying small dwellings, and

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living and sleeping on the ground floors. The mortality has not been great, and few cases only have been of malignant type; those that have proved fatal have generally been instances in which some complication has occurred. Contagion has not been the rule in the spread of the disease over this part of the state; isolated cases have occurred simultaneously in different parts of the same village or neighborhood. The march of the malady has been from south to north.

Lomira.— Dr. H. P. Wenzel writes from here to the following effect: Last winter we had a sharp outbreak of lung troubles, quite serious in character, but with careful management few died. I consider this to have been due to the inclement weather and to needless exposure thereto, and hence I regard it as having been, in part at least, avoidable. We had also an epidemic of Typhoid with a mortality of seventeen per cent. Concerning the origin and means of propagation of this disease, I am in great doubt; it appeared in the most tidy houses, and where the surroundings were quite unexceptionable, as well as in those where the cellars were fetid, the garrets odorous and the yards smelled rank to heaven; in places between which there was no direct communication, nor any indirectly that I could trace. Pettenkofer's theory would explain, it however; *i. e.*, ground-water high, and great moisture = little disease; ground-water low, with little or no moisture = virulence in disease. I have no doubt for my own part that the ground-water is a factor in producing results.

I have noted for the past three years that where limestone ledges crop out near the surface, we have had more sickness than in localities where it recedes to a considerable distance below. I do not pretend to explain the fact, but there it is, awaiting an explanation. It may be added that many of our wells, being sunk in the limestone, act as reservoirs for the sipage water which percolates through the thin layer of soil overlying rock, collecting organic matter in its passage, and that mixture of this water with the harder water from below favors chemical changes and decomposition. We have also had an epidemic of Measles of mild type, and many cases of Scarlatina which proved almost uniformly fatal, cerebral

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complications occurring in every case. *Both Measles and Scarlatina disappeared as soon as rigid quarantine was established and isolation and non-communication enforced.*

I again call attention to the condition of our rivers; they should be protected by law from pollution, not only for the sake of the fish, though they deserve consideration, but on account of the health of the animals who drink from them, and for the sake of safety to ourselves who must consume the milk and meat furnished by the animals.

Madison.— Dr. W. Hobbins gives us this information: We had many cases of Scarlet Fever during the months of March, April and May, at which time the disease was so fatal that I was consulted by the board of education upon the propriety of closing the schools of the first ward for a season. I took the matter into careful consideration and finally decided that such a procedure was unnecessary, but I took the precaution of having that part of the city very thoroughly cleaned up. I found upon a block on which a school building stands, and three others adjoining it, no less than one hundred pigs, all of which I had removed. The school house itself was in a terribly dirty condition, and I caused it also to be thoroughly cleansed, after which other wards received attention. Vaults full of filth were discovered, cleaned out and disinfected. The good results of all this work were immediately perceptible; although the disease did not immediately disappear, and we had many cases after the cleaning was done, its type was entirely changed and the marked fatality ceased.

Mauston.— Dr. J. J. Herrick furnishes the following facts: There has been no special increase in Phthisis or other pulmonary disease hereabouts, but a very decided addition to the number of cases of malarial origin, both in my own practice and in that of other physicians, especially within the past sixteen months. Atmospheric conditions have varied more rapidly, and to a greater extent, in this neighborhood, than has been the case heretofore. As to the degree of soil moisture, I am unable to form any opinion. Your inquiries, however, have started me upon a new line of thought and investigation as to the causation of disease, which I shall follow up, I hope, with profit in the future.

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There has been no notable change in the habits or modes of life of our people, nor has there been any marked increase in our immigrant population. I am of the opinion that there has been a decrease in the number of cases of disease having a zymotic origin, during the last twelve months. There were a few cases of Diphtheria last winter, but happily none were very severe. In each family that the disease visited it showed itself first in a child who had attended the public school. The school house was badly ventilated, not uniformly or properly warmed, and was over-crowded. The one fatal case occurred in a family living in a house where the privy was attached to a wing, its drain running near to the well and close to the surface.

Dr. H. J. Stalker, from the same place, corroborates the above statement concerning malarial disease, saying: There has been a marked increase in malarial disorders here during the past summer and autumn — some say greater than there has been for twenty years. The cause was probably the high water in June last in the Wisconsin and other streams; during the early part of the summer not only the soil but the atmosphere was saturated with moisture.

Medford.— Dr. S. B. Hubbell of this town says: We have had a large amount of Typhoid Fever here, caused, I think, by the following state of things: In June last there occurred a great rise of all the creeks and streams in Taylor county, flooding the whole country and leaving, when the water subsided, a large amount of vegetable and swamp refuse distributed along the banks and bottom lands. Later on in the season we had much rain and warm, cloudy weather, causing wheat to rust and root crops to rot in the ground. I observed that a majority of the cases occurred in families living on the borders of bottom lands or adjacent to swamps, where much of the material above referred to was left by the water and decayed during the warm damp weather which succeeded the flood. In no case did I discover defective sewerage, foul water, or any of the usual causes of Typhoid in rural communities. There was also considerable disease of malarial type.

Monroe.— Dr. F. W. Byers gives the following opinion: Pulmonary diseases have increased decidedly in number, while those

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of a malarial type have not. Immigrants from Norway, more especially, seem to bring with them the germs of Phthisis, and badly ventilated dwellings and unsanitary habits do their part in developing it.

Neenah. — Dr. J. B. Barnett furnishes this very explicit and valuable communication: There has been very much in the course and character of disease hereabouts during the past year to attract the attention both of professional and non-professional men. First in order and frequency of occurrence, and notable as one of the most important of our local diseases, stands Typhoid Fever. For many years it has been questioned whether real Typhoid has been known here at all, but as early as the middle of September, '79, there were many cases that were unmistakable, and within a month thereafter, I think cases of Typhoid outnumbered all other cases of serious disease; without showing any great fatality, it was remarkably persistent in its visitations of some families, not leaving them until the greater part of their members of susceptible age had, one after another, given up to the infection, the number in one particular family reaching six. From a sanitary point of view, this instance was of great interest, affording almost unmistakable evidence of filth origin. Upon an inspection of the premises, I found the well and the privy very near, and probably very *intimate* neighbors, being only eight yards apart, while the character of the soil was such — a sandy loam upon a clay substratum — that there was no obstacle whatever in the way of a free filtration and interchange of contents. I could learn in this case of no evidence whatever of specific infection, for no Typhoid case had existed in the neighborhood to contaminate the well or the vault with specific germs, and yet the character of the disease was easily identified, for all the distinctive clinical phenomena were present.

In another case some miles distant, I satisfied myself that contaminated water supply was the cause. The privy was fifty feet away from the well, but situated upon a loose gravelly soil, only two or three feet deep, and having below it a limestone stratum which dipped sharply toward the well. In this family only one case occurred, though there were several members of susceptible age, for

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the household was wise enough to abandon entirely the use of the well as a source of water supply; had the first family been equally prudent, its members would probably have had an equally happy escape.

Early in the period during which Typhoid was rife, a tendency to Pneumonia was developed, and this was the commencement of an epidemic of that malady which was distinguished by its fatality above all that have preceded it. It also had a sanitary interest from the fact that it afforded evidence of contagiousness in an unusual degree. In a number of families it attacked several members in succession, exhibiting a period of incubation of from five to ten days. Two families lost three members each, their ages ranging from fifteen to fifty. In both these families and in two others where this seeming contagiousness occurred, the disease was complicated by serous inflammation.

In these cases it was hard to identify the exciting causes, but it is fair to conclude that unsanitary surroundings and conditions were at least co-operating causes. The families lived near each other, the houses were built upon low, wet ground, were over-crowded, without ventilation, and unwholesome generally, and their inmates were under-fed and ill-nourished. Certainly the cause, whatever it may have been, was confined to that particular locality in the town, showing that it was probably something distinct from the conditions existing elsewhere, though unsanitary conditions were by no means confined to this quarter.

Diphtheria, in various degrees of severity, seems to have estab lished itself permanently here. Scarcely a week has passed without its quota of cases, and during the spring the number was alarmingly large. The proportionate mortality, however, has not been large, excepting in the months of March and April. Always keeping in mind the question of filth causation, I carefully examined every case coming under my care for possible causes of this nature, but must admit that my results have been negative. Frequently many unwholesome conditions were found associated with my cases, and these seemed to bear a relation to *fatality*, but otherwise the disease was impartial in its visitations. No part of the town has

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been exempt, and in no one quarter has it predominated more than in any other.

New London.— Dr. L. Grasmuck sends this melancholy history of occurrences near this place; I wrote you some time ago in regard to the prevalence of diphtheria in a neighboring town, where a school had been twice disbanded on account of the disease, it having become quite evident that the school was a most efficient agent in disseminating the malady. Lately, in despite of advice and defiance of warning, this school has been reopened, no efficient disinfection having been practiced previously. As a result of this proceeding, diphtheria has again made its appearance in two or three families whose children attended the school, several cases having already proved fatal. Nor is this all. A young lady living in an adjacent town caught the disease while on a visit to the town in which the school is located, and carried it home with her, communicating it on the way to a friend whom she met and kissed. After she had reached her home, the younger members of her family caught the disorder from her, and, in their turn, carried it to school, where it spread to their school-mates and thence through the second town.

New Richmond.— The following valuable paper is from Dr. O. N. Murdock: I have a report to make that is instructive in itself and interesting, as bearing upon and adding one more testimony to a point of vital importance. There has been an outbreak of diphtheria here, limited in extent, fortunately, that in my opinion had its origin in bad drinking water. Two young men, aged respectively sixteen and eighteen years, were working on a farm a few miles distant from town, and using water from a well located in a barnyard, the water being so foul that the older people refused to drink it at all. These two lads, however, either through recklessness or ignorance, perhaps from a feeling of foolish bravado also, drank of it freely, quenching their thirst only from this particular well. They worked on Friday and Saturday, and went home to spend the Sunday; on Monday morning both complained of headache and general malaise, and nausea and vomiting soon followed; in the evening of that same day they began to complain

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of sore throats, and on Tuesday morning the cervical glands were enlarged and indurated, and the tonsils covered by the characteristic membrane. During that day and the next, the false membrane extended its borders, covering the posterior wall of the pharynx, the palate and palatal arches, causing suffocation and death in one case on the morning of the fourth day. The other case held out a little longer; the membrane, thick and leathery, would be thrown off and again form, the fever continued, and thus matters went on, till finally the reception of nourishment became impossible, the vital powers gradually failed, and death followed.

At the first house, great care was exercised in disinfection and fumigation, and no further case of the disease appeared. At the second, where no care was taken and cautions were unheeded, six cases followed, none of which, however, had the virulence and malignancy of the first. I may add that the family living upon the farm where the well above spoken of is situated do not use the water from it at all, but draw their supplies from a cistern provided with a proper filter. I have reported the case thus minutely, that there may be no doubt of its character.

Oconto.— Dr. D. P. Moriarty, writing from this town, reports a very satisfactory condition of health generally among its inhabitants, and adds: The increased and increasing use of water from artesian wells for drinking purposes seems to have done away, in a very large measure, with typhoid fever, dysentery and kindred diseases formerly so common here among us.

Dr. H. Allen, in a communication from the same place, describes a locality which furnishes an exception to the general good health of the town: We have had many cases of typhoid, which I attribute to the water used at the boarding house of the Oconto Lumber Company. On examination, I found the well situated in the middle of a large stable occupied by sixty or seventy horses; the water had a very bad taste and odor. About June 1st, ult., the greater part of this city was submerged, and the contents of all the privy vaults were distributed impartially over the town. There being no efficient system of drainage, the water remained stagnant in pools here and there for weeks thereafter, causing a most

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abominable stench; this state of things contributed in no small degree, in my opinion, to the unusually large amount of sickness we are having this fall.

We have had one case of Small-pox here — a very severe one. It is almost certain that the disease was contracted on a railway train somewhere between here and New Brunswick. Every precaution was taken to prevent its spread, and, I am happy to say, with success.

Oshkosh.— Dr. G. M. Steele makes this contribution from this city: I am inclined to think that there has been an increase in the number of cases of Phthisis, of late. That there has been such an increase in the number of cases of Pneumonia and of bronchial difficulties, in this vicinity, there can be no doubt. Perhaps the greater prevalence of these less severe pulmonary affections may explain the increase in Phthisis; they certainly may act as exciting causes where there is any predisposition to tuberculosis, hereditary or acquired. I can recall one case, at least, in which this was very clear.

Malarial diseases have not been more frequent than usual during the past year. At one household, some eight cases of malarial fever sprang up quite nearly together, the cause of which we were able to find in the drinking water used. Foul drains in close proximity to the well caused the contamination, though the well was quite deep. An examination of the water resulted in showing the presence of organic matter in considerable quantity. During the early part of the season, Diphtheria raged here in a malignant form, but for some months, now, there have been but few deaths from this disease, in this vicinity. My observations have led me to exercise more and more care in isolating the sick in cases of Diphtheria; two or three years ago, I thought it much less contagious than I hold it to be now.

The total amount of sickness hereabouts has not been above the average for the past year, I think; still this is only an opinion founded upon my personal observation, and might be greatly modified if we had here an efficient local health board, doing good work in the way of accurate statistical records, which organization at present we lack.

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Oxford.— Dr. A. G. Stoddard reports from here as follows: The only unusual event of the year was the occurrence of Pneumonia during the late winter and early spring months to an extent which heretofore was unheard of. I have questioned old residents who have known this district for thirty years and more, and not one of them can remember a visitation which affected so large a number of persons. The winter was characterized by sudden and extreme fluctuations of temperature, with a high degree of humidity. The majority of those attacked were of the poorer classes, many of whom lacked sufficient clothing, especially of the feet. The death rate was low, and the disease uncomplicated.

Racine.— Dr. J. G. Meachem sends the following suggestions which will apply to other latitudes than that concerning which they were made: It would seem that if we were to act with ordinary common sense only in regard to personal care and responsibilities, we could easily have that perfect hygiene which we are now trying to obtain. The fact is, that many diseases and much ill health arise from our own negligence or carelessness, and so far, at any rate, we are our own destroyers.

If we look at the various places of filth to be found in our yards, streets, alleys, vacant lots, etc., we can but be aware that their presence is due to some lack of care in personal responsibility. An accumulation of filth is but a small matter in itself, but if it be allowed to remain through heat and rain, which aid decomposition and transform it to a heap of rottenness, giving off mephitic vapors, to poison the air we breathe, and a solution of nastiness to saturate the soil on which we live, and to contaminate the water we drink, it then becomes a very different matter and one that affects every citizen. No individual has any right morally, whatever he may think his legal rights are, to maintain a filth nuisance which shall in any way compromise or endanger his own health or that of his family or his neighbor. Far less has a city the right to allow any local or preventable cause of ill health to its people to remain unabated.

There are numerous instances on every hand in which individual care and responsibility can avail much in preventing sickness and death. There are also matters which it is the province of the city

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as a municipal corporation to regulate. Two of these last named demand special attention at this present time, i. e., a general system of scavenging, especially of privy vaults, and the water supply. The rapidly increasing necessity for both for the future maintenance of health among our people will soon demand that attention be given to them. Pure air and wholesome water are needful for the preservation of good health. If, however, anyone walks up and down any one of our streets on a warm humid evening, he cannot fail to notice the odor which rises from the accumulations in the vaults. Such air is poison to everyone who inhales it; this is a condition that can be and should be changed. A system of earth closets, with regular scavenging can be maintained at a very moderate cost, and with great advantage to the health of our people.

Reedsburg.— Dr. C. A. Rood gives this very suggestive and instructive account: I have had two cases of Scarlatina in one family; one malignant and fatal, both originating, as was supposed, through the agency of a hired girl. Only five or six days before coming into the family of my patients, this girl had been living in a house where there had been Scarlatina, but she claimed that she had taken every precaution in the way of bathing, etc., and asserted that the clothes which she wore had not been in the infected house at all, every one of which assertions may have been true. She allowed the children in the second house, however, to play with her in various familiar ways, particularly to comb her hair, which probably contained the germs of the disease. For months previously, there had been no Scarlatina nearer than nine miles to these children, to my knowledge.

We have had some Measles, a distinguishing feature of which was the great length of the incubating stage; in nearly or quite every case which came under my care, or which I could hear of, three weeks was the shortest time, and from that on to five and six weeks, elapsed between the time of contracting the disease and the appearance of its characteristic symptoms.

River Falls.— Dr. S. M. Davis narrates the following history: There has been no epidemic during the past year, either here or within two miles of this village. There have been many sporadic

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cases of Typhoid Fever and Diphtheria of malignant type, traceable to filthy surroundings, and filth in the water supply, of which the following are illustrations:

In a family numbering eight persons, Typhoid made its appearance in July, and by the 1st of September every member had suffered from it, one case proving fatal. The house in this case stood on the brink of a hill on a clay subsoil; sixty feet distant and up a gentle slope was the cow stable and piggery, whence every rain-storm washed filth down to and around the house. The well was fifteen feet below the house, was twelve feet deep and had a goose pond close by; the water therefrom being examined, showed decided evidence of contamination by animal filth.

In another family of seven members, composed of father, mother and five children, whose ages ranged from two to eleven years, Diphtheria made its appearance, the first case proving fatal within twenty-four hours. The second day of the outbreak, one child being already dead and all the others sick, I was called in; I found a state of things almost baffling description. The doors and windows were all closed, and upon the stove which heated the room, the only apartment in the house, were two kettles and a pot of water. A cask or barrel half filled with swill stood close to the stove, and the condition of the inmates may be imagined, especially when I add that the house was wholly without drainage and was built upon a damp clay soil. As soon as practicable I had a better sanitary state of things brought about, and the children who were last attacked all recovered. I am convinced that a chief factor in aggravating Diphtheria is filth, and confinement in damp, ill ventilated apartments is also a very effective agent in developing the disease when its germs have once obtained a lodgment.

Rosendale. — Dr. S. Hall has done a good piece of work in this place of which he gives the following modest account: Will not others who are qualified "go and do likewise?" The organization, if such it can be called, of the board of health in this town is very carelessly effected, and the appointment of a health officer is a mere device for the purpose of shuffling off the responsibility of making a report. It is quite true that our population, being a farming one

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generally, and therefore quite widely scattered, there does not *seem* to be the same need for the active intervention of a local board that exists in some of our larger and more compact villages and cities; nevertheless, even here, there should be a full and effective organization of such a board, for no one can tell at what moment Diphtheria or some kindred malady may come into our midst and require such prompt and energetic measures as can be effectively taken only by the agency of such a body.

I made a brief address last winter before the Farmers' Club of this place, on hygiene, which subject was before the club for discussion. The most prominent idea in my mind at the time was that of the dissemination of disease by contagion. I instanced especially a case in which some emigrants left a district in Germany where Cholera was prevalent; there were no cases of the disease in the port from which they sailed, none of the party were suffering from it, nor did any case appear on ship-board during the passage. In a word, no trouble at all choleraic in character manifested itself until after the arrival of the whole party in Dakota, where they settled; then and there, however, circumstances favored the development of the disease, and, when their household goods were unpacked, it broke out, showing itself first among those who had done the unpacking and who made use of the articles, and spreading from them through the whole community. This case showed that the virus of Cholera, like that of so many other zymotic disorders, may be boxed up with textile fabrics and transported over long distances, remaining dormant the while, until circumstances favor, and susceptible subjects are found.

From this I passed on to the consideration of the virus of other diseases, particularizing Small pox, Scarlet Fever and Diphtheria, the two last of which are unfortunately only too well known among us, and thence went on to consider the dissemination of disease by the agency of polluted water, speaking especially of wells and similar sources of supply and of their undue proximity to cess-pools, privies, drains, etc., and ending with a discussion of house ventilation and the means of introducing pure air. A good deal of ground was covered in the course of the talk, though, as I am well aware,

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in a very off-hand way, as the whole was delivered extemporaneously, and with scant time for preparation.

I have found much ignorance concerning all these matters among the people, but I have also found a strong desire to obtain trustworthy information about them, and I think that physicians generally might gain honor for themselves, and do much good by spending a little time occasionally in this work of extending popular knowledge. I fear that as a class we have not set these things before the people as much as is our duty, and I for one shall be glad to avail myself of any opportunity that may offer for so doing, whether by remarks, even though they may be crude, or by distributing documents prepared by competent authorities upon matters connected with public health.

Sauk City. — Dr. H. G. Lachmund, late a resident here, but now in Germany, gives the following explicit and interesting account of sundry conditions affecting the health of the city: Our city and its vicinity have been suffering severely for some time past from Diphtheria, whereby we have to lament the deaths of many of our people. According to the statement of the Catholic priest on the opposite side of the river, not less than twenty-two funerals have been celebrated within ten weeks, the majority being those of victims to this disease.[1]

In the winter of 1865–66 we suffered from an extensive Diphtheritic epidemic; at that time I called the attention of our common council to the dreadfully filthy condition of the town, and the authorities at that time willingly and promptly carried out the proper sanitary measures, removing manure heaps, cleaning the streets and alleys, emptying and disinfecting overflowing cesspools and privy-vaults, causing the removal of slaughter-houses to beyond the municipal limits, and generally placing the town in good and cleanly condition. The beneficial effect of these steps was promptly

[1] How many new cases of Diphtheria originated among those in attendance upon such of these funerals as were held in public can never be known. clergymen of all denominations should earnestly dissuade their parishioners from having such public services in case of death from diphtheria or other contagious disease.

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seen in the rapid diminution and speedy disappearance of the pestilence. Most unfortunately, however, the very last case was that of one of our councilmen who had supported me most energetically in demanding, and in the execution of the hygienic measures above detailed.

With the disappearance of the disease zeal for cleanliness slackened and gradually matters slipped back to the old standard, even slaughter houses moving into the village limits without opposition, and finally taking up their stand in the most thickly populated portions. To-day there are living upon an area of eighty acres more than one thousand people, who keep about three hundred cows with a proportionate number of horses, swine and chickens, and a disproportionate number of dogs. Taking this fact into consideration, and having due regard to the further facts that the sentiment of not a few among the residents is opposed to the maintenance of scrupulous cleanliness, that manure piles have again accumulated, that privy vaults are once more filled to overflowing, so that during warm weather the atmosphere is offensive by reason of the effluvia therefrom, and we frequently hear strangers remark that "the place stinks;" considering all this, there will be no difficulty in comprehending how it is that disease maintains its footing here among us.

A year ago I deemed myself justified in warning our village government that an outbreak of Diphtheria was imminent, and that proper hygienic measures should be carried out at once; no attention was paid to the warning, and inaction has remained the rule, even though fatal cases have been occurring among us ever since.

There is here a slaughter house, the owner of which lives not more than a hundred and twenty feet away from it; the building is floored with plank and under the floor is a hole for the reception of blood, the removal of which, the proprietor says, "is cared for every time." A three-years-old child, the daughter of a sister who was on a visit to this man at the time was taken down with Diphtheria but recovered. Soon after, his own daughter aged twelve, also contracted the disease, but recovered, to be again attacked six weeks later, recovering however, a second time. Next his son, aged ten,

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was seized; at eight o'clock in the morning of the next day I found him in a very serious condition, and five days thereafter, he died. A second son, aged eight, was the next attacked, and died on the tenth day. Five days after his death, a third boy, aged six, was taken, and he also died on the sixth day of his illness. When the second of these cases came into my hands, I urged the necessity of cleansing and disinfecting the slaughter house and the privy; when the third case occurred I asked whether anything had been done and was answered in the negative, and I made the same inquiry, to which I again received a negative reply, on the appearance of the fourth case, the first that proved fatal. I was not called in to the fifth and sixth cases and cannot say whether anything was *then* done or not.

My conclusion decidedly is, that the disease first originated in the house where the six cases mentioned above occurred, and that by the action of the miasmatic atmosphere there, the Diphtheritic poison finally acquires a degree of concentration, and a power that no constitution could resist. The condition of the premises may be judged from the fact that when at last they were cleaned, one of the workmen employed upon the job was completely overpowered by the horrible stench and forced to discontinue work. I, myself, was at the time busy in my garden, situated in an adjoining block, with three lots intervening, and was sickened and obliged to quit work by the same cause. I think, moreover, that I risk little in attributing an attack of Diphtheria under which I personally suffered soon after, to the effluvia arising from that spot and its vicinity.

Shawano.— Dr. J. D. W. Heath writes to the following effect from this place: Since my appointment as health officer of this city, I have taken active measures for preventing the spread of Diphtheria, which has lately made its appearance among us, by placing Shawano in the best possible sanitary condition. The disease, however, prevails to a considerable extent; in several cases all the children in a family, nursing babes included, have died; it is almost needless to say that these little victims had been living under the most unsanitary conditions.

The first cases that came under my care were in a family that

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had moved into a log cabin which had been standing vacant for five years previously; they had taken up their residence there but for a short time when Diphtheria broke out among their children, five in number, all of whom were attacked, one case proving fatal. During my absence from town for a brief season, the disease appeared in a family living within the city limits, and very soon thereafter in yet another household, also within the city lines. Neither of these families had any communication with the first mentioned, whose residence was five miles away, or with each other.

In spite of all the care that physicians can give to prevent contagion, and in spite of the vast amount of conclusive evidence of the contagiousness of Diphtheria, there are yet many who shut their eyes to the facts and proclaim that they "*don't believe that it is catching*," and who not only visit the sick freely themselves, but take their children with them — and wonder "how it could have happened," when the inevitable result of such conduct follows. Many here and many in the town of Richmond, where the mortality has been very great, labor under this delusion and act in this way. Another thing worthy of attention in considering the spread of the disease is, that in many instances where it breaks out in log-cabins or other one and two roomed structures, *sick and well live and sleep in the same apartment, sometimes even in the same bed.* In many of these dwellings it has proved extremely fatal, and what wonder? In a single case only the well members of a household were removed, two days after the appearance of the first symptoms, to a new shanty.

This was one of the families in which Diphtheria first appeared, and in which contagion could not be traced. I examined the well and the water used, with the following results: The well was situated thirty-four feet from an old disused privy-vault, and about as far from a new one; it was ten feet deep, planked up, and had recently been filled to the top with surface water. Its fluid contents held a large amount of organic matter in solution. Other wells were examined where the disease prevailed and the water was found equally bad. Herein, I think, lay at least a predisposing

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cause; the heavy rains of early summer filled many cellars with water, leaving them in an exceedingly bad state. I have found by personal examination very many of death's hiding-places, which I have had scoured out thoroughly; our prospects were very good for a prolonged visitation from the enemy not long since, but now we hope that he may be kept away. One thing against us is the fact that many of our people are Germans and cannot read English; hence their only way of learning is that of sad experience.

Sheboygan. — Dr. J. J. Brown, of this city, sends a communication, originally printed in a local newspaper, from which we make the following extracts as having a more than local interest: The surface of our city is a bed of porous, sandy soil, everywhere underlaid by an impervious bed of clay. The rain that falls is readily absorbed by the sand, and remaining in its lower portions, constitutes our water supply. Where the city is not thickly settled, perhaps reasonably good water may be had, but in the central portions of the town the wells are not only shallow (the clay in some places coming within two or three feet of the surface), but they have, in their immediate neighborhood, numerous privy-vaults, cesspools, stables, etc., the drainage from which gives a very decided flavor to the water. A moment's reflection should satisfy any one that *such a state of things is dangerous*, that it may at any time be the means of spreading disease and death and desolation through many a home. A hot, dry season, causing low water in the wells, will concentrate the impurities therein, and then a single case of disease may act like a torch in the midst of the most inflammable material, and kindle a conflagration that shall consume many lives.

This state of things has been gradually growing upon us, and the evils attendant upon it have been constantly accumulating without notice, until they have reached a point where longer to neglect and to continue them is to violate directly the plainest sanitary law. In the absence of any regularly organized board of health, our people look to the common council for wholesome sanitary regulations, but the record of that body has not been especially worthy of commendation in this respect for some time past,

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and the sanitary administration of our city government is wholly unworthy of a municipality whose people are second to no other community of the state in enterprise, intelligence and morality.

Let any one stand on the lake shore and observe the structure of the ground on which the city stands; let him note the sandy soil above and the solid, impervious clay below; let him note also the shallow wells and wet cellars, wherever the sandy stratum is thin, and the readiness wherewith water flows through that stratum from place to place; and finally, let him observe the character of the well water in places where the people and their privies are most closely congregated; no one doing this can fail to perceive the urgent need for a change. I know very well that every man thinks his own possessions perfect, and that every one considers that the water *in his well* is excellent, yet it is a fact, nevertheless, that every well in the city is a source of danger. May we not soon hope for better things? Let us substitute the dry earth closet for the privy vault, fill up the wells and draw our supplies of drinking water from Lake Michigan, and by so doing save many a life of value to the community, and keep many a home from being desolated.

Sheboygan Falls.— Dr. C. B. Cody writes from here as follows: There has been no notable increase of cases of Phthisis, but a very great one in the number of cases of Pneumonia and malarial disease, of which we have had more than for many years past. We have also had some cases of malignant Diphtheria, which has not been known here for years before, the mortality from which has been fifty per cent. This disease was imported by a young man who contracted it in a lumber camp, in which he had been working when it broke out, and where nearly every man had died. This lad also died within two hours of the time when he reached home, and his sister took the disease from him, and died within forty-eight hours thereafter. Four other fatal cases occurred in the building where these young people died and the one next adjoining it, within a few days, all the circumstances going to show the malignancy of the disease.

I am unable to assign any definite cause for the increase of Pneu-

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monia and malarial disease above mentioned; it is true that we have had an unusually wet season, but that circumstance had little, if anything, to do with the causation of sickness.

Superior.— Dr. E. S. Gavreau gives this fact: Pulmonary diseases are prevalent here, especially among the half-breed Indians; their cause is generally deterioration of blood, aided by imprudence and exposure.

West Branch.— Dr. A. Shambaugh sends this cheering piece of information: People here are gradually learning how to prevent sickness by draining their grounds and purifying their dwellings. Physicians and laymen have alike become interested in this matter, and have helped and counseled each other to the same good end. Yet, though much has been done, there is abundant room for improvement, for we still have among us Diphtheria, Typhoid and Scarlet Fevers and Erysipelas, though in generally mild forms.

In connection with the foregoing extracts from communications from special correspondents, we present the following selections from letters from the clerks of

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in which will be found much of general interest; many facts which tend to explain the prevalence of disease in some localities, and suggestions for the improvement of public health. A most encouraging feature in prosecuting the work of the board is the growing interest shown from year to year on the part of the above-mentioned officers, to whom the secretary is indebted for many communications which have proven exceedingly useful, and for which he here returns sincere thanks. As in the preceding excerpts, the arrangement of these is in alphabetical order, but the names of the writers are not given, in deference to what is believed to be their general desire.

Anchorage.— Having taught school for many terms, I can testify that the elaborate paper in your last report, upon the condition of our public schools, contains nothing more than the truth, and I be-

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lieve that if your recommendations were carried out, there would be a vast improvement.

I am convinced that very much of the restlessness and inattention, much even of what teachers sometimes attribute to willful mischievousness on the part of children, is really due to the discomforts arising from lack of pure air. Many of our school-houses are built seemingly in defiance of all sanitary laws.

We Americans, as a people, boast of our free *public* institutions, and are apt to be dazzled by their glare, while the *domestic* institutions — those which more nearly concern the welfare of the individual and the family — fail to receive the attention which is their due. I trust that the wise suggestions concerning home and school life, contained in the preceding reports of your board, will do something toward educating the people in the duty to themselves and their children, of providing cleanly and healthy homes and school buildings.

Afton.— We have had some cases of sickness that were attributable to the use of water from wells that had become very low and foul. Aside from these, our town has been unusually healthy.

Belle Plaine.— When I made my formal report to your board, I had a clean bill of health, but since that time we have had several cases of Scarlet Fever and Diphtheria. In the early part of the summer, we had excessively heavy rains, which produced a considerable amount of decaying vegetable matter. In my own neighborhood, I took the precaution to burn all such stuff, as soon as it was dry enough to do so,[1] and in this way I think that I promoted the health of the residents. At any rate, we had not a single case of disease, although it raged fearfully to the north of us, whole families there having been swept away.

So hard is it to convince people that Diphtheria is contagious, that they will not only have funeral services publicly held, but, in case of death from it, they will keep the body three or four days, till all the relatives can be gathered together; of course, these are

[1] A very wise proceeding. Were this generally done, the health of many neighborhoods would be benefited.— SEC.

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liable to take the infection home with them, and in a few days others may be stricken down, to communicate the disease in their turn, and so the contagion spreads from constantly renewed centres, in ever widening circles. "It is something in the air," they say; "it makes no difference whether we associate with those who have it, or not! If we are to have the disease, we shall take it anyhow; and if not, we are safe anyhow!" Now, as a matter of fact, not a single case has occurred around here that cannot be traced to either attendance at a funeral, or direct contact with the sick. Another fact is, that where there is the most filth, there mortality is the greatest. In shanties and log cabins with low ceilings, without ventilation, having little light, with dark, damp cellars under the living rooms, the ground around the back door saturated with slops, generally a great deal of filth and garbage inside the house, and the inevitable swill barrel in the cupboard giving off its abominable odors — in such places as these, Diphtheria and fevers hold high revel.

Only the other day, in a neighboring town, a girl died from Diphtheria; the body was kept until all the friends could be assembled, and was then taken to another place and there buried with a good deal of ceremony. Now, in the town in which the interment took place, there has been no case of contagious disease for a number of years, and the people are a good deal exasperated at the idea of having been compelled to run so great a risk at the pleasure of any and every one, and the feeling is growing among them that the health officer of a town should have power to prevent such occurrences.[1]

[1] Diphtheria has been the scourge of this state for many months past, and so long as the lack of all precaution, well described by the above correspondent exists, it will continue to be so. The State Board of Health earnestly invites our citizens to heed such warnings, and to remember that the various local health boards have the fullest powers to do any and every thing necessary to prevent the spread of contagious disease. The people have it in their own power to put a stop to such performances as that above described. *Vide* extracts from Revised Statutes, published in reports of this board.

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Bloomingdale.— My report contains nothing of value. How can it when our local board takes no interest whatever in health matters, neglecting to appoint even a health officer, though we have three resident doctors? Our town is generally healthy, though I can obtain no statistics.

Bonduel. — In a neighboring town Diphtheria is raging with fatal effect, and I think that it will increase greatly during the fall and winter, as nearly or quite all the funerals of those who die are public, and no precautions otherwise are taken against its spread.

Darlington.— Our town is in a generally healthy condition, but, as in most other places, great sanitary improvements might be made. There is much neglect in the matter of cleanliness, although we are certainly ahead of many towns in this respect. The most objectionable thing that is done here is to neglect the cleaning and disinfecting of cess-pools and privy-vaults in hot weather. In some parts of the city the stench is very bad, especially on sultry evenings. Gen. Bintliff, of your board, is very active in giving advice and doing whatever he can in the matter.

Edson.— Diphtheria, Scarlet Fever and Whooping Cough have all been rife in this locality; in some instances Diphtheria and Scarlet Fever have attacked the same individuals simultaneously, such cases being very fatal. In yet other instances Whooping Cough has attacked those convalescent from Diphtheria, and carried them off very rapidly. The doctors say that the severity of many attacks has been due to the lack of proper drainage, most of the cellars being wet, and to the want of sufficient ventilation in small, cramped bed-rooms.

Gibson.— We have no resident physician here, and bills for medical attendance range very high; from these two circumstances it happens that very many, especially among the poorer classes, when sick, call in no doctor, but trust wholly to the merits of some vaunted patent medicine, too often with most disastrous results. Diphtheria and Scarlet Fever are prevalent, both occasionally attacking one individual at the same time.

Grant.— Diphtheria has raged in the northwestern part of this town, but the local health board has done nothing to prevent its

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spread. I notified the board of its existence, and advised the closing of the district school, but no attention was paid to the matter. The people are very careless, too, in going from house to house where the disease exists; some claim that "whoever is to have Diphtheria, will have it, anyhow," in spite of precautions! So things go on, and so diphtheria spreads.

Juneau.— Diphtheria was brought here by an individual coming from Fond du Lac; he was taken sick in a family resident here, whose children all contracted the disease, from which four of them died. Other relatives of the family also caught it, and thus the malady was spread through our town.

Kingston.— It seems very strange, indeed, to me, that we have not had some serious outbreak of disease in this locality, owing to the following circumstances: This is a low, wet, marshy region, with occasional sandy ridges, varying from two to fifteen feet in height above the water level; the marshes are usually covered the year round with dead, stagnant water, in which are found great numbers of small fish; so numerous are they, indeed, that it is very common for them to be caught in the cranberry rakes which the pickers use in gathering that fruit. During the fall of '79, these marshes became unusually dry, and a consequence of the drought was the death of the fish by thousands; but this was not all: many of the streams which contain larger fish also became low and dried up to a great extent, and the fish in them gathered in great numbers in the pockets and sink-holes in the beds of the streams; the boys, under these circumstances, amused themselves by frequently visiting these pockets and by catching and killing the fish in large quantities. The larger part they left to decay on the banks, and the stench arising from dead fish on the marshes and along the streams was horrible. What, with these causes and the amount of rotting vegetation laid bare, it seems to me a wonder that we escaped a pestilence.

Kossuth.— Diphtheria and Scarlet Fever have prevailed here to some extent, but, so far as I can learn, few cases have proved fatal. There is little if any doubt that in very many instances these diseases were aggravated, if not caused by the use of bad water for

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drinking purposes, and by lack of cleanliness both of person and dwelling.

Lawrence.— I notice that there is more Diphtheria where privies are close to the water supply. Where it has proven most fatal, the dwellings were on sandy soil, and the privies were nearer to the wells, etc., than in any other places in the town.

Lincoln.— Most of the houses around here are log houses, the rooms are small, and there is generally a cooking stove in the room where all the family eat and sleep. There is usually a cellar, or a hole called by that name, where potatoes and other vegetables are stored through the winter. How such a way of living can be healthful, I can't see. Those who live away from streams and lakes generally have the best drinking water.

Luck.— There are several points in this town to which I have called attention, which threaten the health of the people, and, if not remedied, will, in due time, bring forth a crop of disease. First, I note the absence of privy accommodations from many houses whereby filth is left in all manner of unsuitable places. Our people are, however, too neat and cleanly in their dispositions to tolerate any such state of things very long, and they are very rapidly remedying this matter. Secondly, the cattle yards and manure heaps are much too close to the houses and their water supply, and this is bettered very slowly if at all. Thirdly, the settlers hereabout use unwholesome water from swamps, creeks, and shallow wells — water brackish to the taste and repulsive in appearance. Still, many who are possessed of time and means have dug good wells during the past year, and it is to be hoped that the evils arising from this source will disappear in a comparatively short time, especially as it is coming to be understood that good water may be had at a moderate cost.

To the second and third of the above named causes is to be attributed, I think, an outbreak of Typhoid Fever in a neighboring town. Yet a fourth cause of sickness is to be found in the many swamps in our vicinity, the influence of which is felt in dry seasons; I have noticed at such times that there seems to be an unwholesome atmosphere surrounding them, arising probably from

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decaying vegetable matter. Were these swamps properly drained, which might readily be done at moderate cost, and the other matters herein alluded to properly cared for, our locality would be one of the most healthy in any part of Wisconsin.

Monroe.— I have made as full a report as I could, but cannot say anything about diseases and their causes. We had a health physician appointed two years ago, but he refused to act unless reasonable compensation be allowed him; he says that he has already done considerable work without remuneration, but that if he has a competent appointment and pay, he can and will open up some nuisances which have long been eye and nasal sores to the community, as well as some others that are more hurtful though less prominent.

We are in this village cursed with some poison breeders which are of such nature that no one likes to meddle with them except in discharge of plain duty. One member of our board does not wish to stir unless the others are ready also, and so things hang. I wish that your board could take steps that would lead us to some decided and beneficial results.

[The case above described is a very common one, and one moreover which may easily lead to serious trouble. No physician can give the time and skill necessary for the proper performance of the duties of a health officer without adequate compensation therefor, nor should any man be expected to do so. Neither will any honorable man assume an authority which has not been placed in his hands in a regular and legal way. A quasi appointment, made two years ago and probably not subsequently renewed in any way, is wholly inoperative to-day, and no one can be justly censured for declining to act officially in any capacity, especially in one involving such important interests as that of health officer, under such circumstances. Let the town board, acting as a board of health, appoint unmistakably and unequivocally a competent man as health physician, and pay him a fair salary for his services, requiring him to put the town in good sanitary shape, and supporting him in the exercise of the authority necessary in so doing. It will be found in the end a wise economy, and one that will save the town as a

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whole, and its citizens as individuals, many times the amount expended, while neglect in doing so will probably, almost certainly, result in the loss, not of money alone, but of health and life in addition thereto.— SEC.]

Neillsville.— The particulars of the Typhoid cases occurring here are as follows: A family composed of father, mother and seven children all lived and slept in two small rooms, wholly without ventilation. The sickness began with the children, two of whom died; the mother and a young woman who waited on the sick were also attacked, but finally recovered. The physicians regard this as being a typical instance of poisoning from over-crowding and bad, or rather no ventilation. We have had some cases of Scarlet Fever, but they presented no features of special interest.

Northfield.— The principal cause of sickness in this town is, I think, to be found in numerous small, wet sloughs into which the waters of many springs flow, forming sinks which receive filth in various forms, and often look as though kerosene or other oily or greasy substance had been poured into them; the odor emitted from them is in many cases *vile*, and cannot be conducive to health. Very many of our people have wet cellars.

Perry.— Could something be done to compel school districts to provide more suitable out-buildings, a standing disgrace to most of our public schools would be wiped away. When I was first elected as district clerk, some dozen years ago, the first thing I went for was to have a privy built; I knew no better then than to have a large building with a partition in the middle, but even this was a vast improvement on the plan which had prevailed up to that time of "all faring alike in the woods." A year or two later I discovered that my plan was a very poor one; the partition had been so constructed that it did not reach the roof, and thus opportunity was given for throwing various things from one compartment to the other; the boys also took advantage of knot-holes and chance crevices which they enlarged with their jack knives, and finally the green lumber used shrunk so much that the whole structure had to be battened up.

I brought the matter up before the board several times and was

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laughed at for my pains, but I persisted and at last succeeded in having separate buildings for the sexes on opposite sides of the yard. Even yet, however, this school house is the only one in the town that has even an approach to decent privy accommodations, and this, though we have some very fine school buildings for a country town.

We have one that cost $800, but the outhouse attached to it makes me ashamed of the town whenever I pass it; it is absolutely worse than the brush; fancy a small affair, six by eight feet, not four rods from the school house and facing the high road, having a partition in the middle, and the *doors side by side!* I blush for my town and for my fellow-citizens who can pass so carelessly over a matter of such prime importance upon the plea of the man quoted in your report that "the children are young."

As regards wet cellars, this season for the first time, I have heard of many, and, curiously enough, the houses on the highest land are the worst off in that particular.

Should I undertake to point out the worst defects in our farmers' habitations, I should say that the first is in the ventilation; fresh air is not as plentiful as it might be in them, considering its cheapness. Next, I am afraid that the water supply is seldom as pure as it should be, but I don't think that the proximity of privies and wells has anything to do with it; barn yards and manure heaps certainly are too close to the springs and wells that furnish the family supplies of drinking water in some cases, and there are some persons who make use of unfiltered cistern water.

Princeton. — The last report of your board contains much that is excellent and worthy of close attention. The papers on schools especially should have the widest possible circulation. Having called attention to the condition of school privies throughout the state, can you not now do the same service for the conveniences provided at railway stations, and the deplorable lack of similar public accommodations elsewhere where they are needed? In Paris you may find "*cabinets d'aisances*," properly kept and open to any passenger on payment of a very trifling fee — one cent or thereabouts — but here we have nothing of the sort except at rail-

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road stations and similar places, and the condition of these is too often simply disgusting. At some of the larger stations they will finish up a privy, i. e., so far as painting it externally, and perhaps internally, in very good style, is concerned, but thereafter nothing is done in the way of keeping it decently clean, or of preventing obscene inscriptions on the walls. One or two stalls are generally kept under lock and key for the special use of the station agents and other *employes*, but the remainder is given over to nastiness — no cleaning is ever done, no disinfection ever attempted. No man around the building, no laborer, brakeman or section-hand could be induced to undertake such a duty; they would strike in a body first. Why should men display such foolish squeamishness in this direction, when in hundreds of other instances, far less important, they show none whatever?

Typhoid and kindred diseases are the last arguments of Heaven against uncleanliness, and perhaps we should "rejoice with trembling" that they are sometimes brought to bear.

Sheboygan Falls.— We have had sixteen cases of Diphtheria, nine of malignant type. The disease was brought here by a young man who came from the northeastern part of the state. By careful isolation, it was confined to two families, but these two suffered severely, five cases out of the nine above mentioned proving fatal.

Stevens Point.— We had very high water here last June, and there are yet many stagnant pools that should be drained or filled up. Of course these have much to do with the sickness prevailing, but, as we have no street funds in our treasury, nothing will be done with them.

Trimbelle.— "The people perish for lack of knowledge." As an instance, during the winter of 1879–80, there was considerable Diphtheria in the western part of this town; during the following summer I learned that it had been confined to a cluster of Swedish houses and had been very fatal; the doctor who had attended the greater part of the cases told me that the mortality was confined to certain houses, which drew their water supply from one source, and that on examination, he found this source contaminated by the washings from a dung-heap; the physician induced them to make a

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change and obtain their drinking water elsewhere, which being done, the disease disappeared.

Contaminated drinking water is in my opinion responsible for a vast amount of sickness, in this vicinity, at least. While making my rounds as census marshal, I found it hard to get a decent drink. Want of proper drainage about the house, and slops and garbage around the back door, the odors from which are mingled with those from the pig-pen and cattle-yard, must also come in for a share of the blame. So long, however, as people resent any interference with such "personal affairs," and show their resentment at the polls, we can't look for anything much better. A plain, vigorous pamphlet, setting forth the methods of rendering the farm house a healthful place of residence, and showing how farmers and farmers' families are poisoned by unsanitary surroundings, published by the State Board of Health, and widely circulated among our rural population, might be of much service.

Washburn.— In my opinion very many cases of sickness are caused by the want of proper sanitary conditions, as for example, the lack of cleanliness in privies, cess-pools, drains, etc., the proximity of manure heaps, pig-pens, and the like to dwellings, the failure to remove dead animals in good season, and neglect in other similar matters. If it were not for the provision made by nature for disposing of noxious effluvia and gases, arising from these abominations, sickness would be far more frequent than it now is.

Wautoma.— Whooping Cough was generally spread all over the town by the agency of the public school, into which it was introduced in the usual way [by some pupil just convalescent from, or just developing the disease, or by some infected garment].

Winfield.— Our local board has never taken any action and seemingly never intends to take any. We are sometimes scourged by Scarlet Fever, which spreads simply because no steps are ever taken to prevent it from spreading.

Worcester.— In the event of an epidemic of any kind, we are very much exposed. In the immediate vicinity of the village of Phillips, there are numerous swamps where some little drainage has been done, but there is little if any danger to be apprehended from

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them. At the foot of the village, there are three lakes, Elk lake being the largest, all which are tributary to the Chippewa river. To facilitate log-driving, several dams are thrown across the river at this point which were kept closed for a long period of time, and finally opened during the hottest weather, and the water was suddenly drawn off. One result of this proceeding was the killing of the fish in large numbers, and their being left to putrify along the banks of the lakes and the river. The stench from them and from the rotting vegetation, also laid bare at the same time, was terrific, and fears were entertained lest serious sickness should result. Providence favored us, however, and we escaped for that time, but can we stand a repetition of the same performance and feel safe?

[From a report made by Dr. J. G. Meacham, Jr., to the common council of the city of Racine, we make the following extracts; they have a more than local interest inasmuch as they go to confirm statements heretofore made in the reports of this board, and as there are many other cities in Wisconsin where a state of things exists that is equally prejudicial to health and life.]

A portion of the first ward of the city of Racine is used mainly for railroad and manufacturing purposes, and but few families live there. In the remaining part, whose area is not over sixty acres, are found one hundred and forty-one wells which supply water for drinking and culinary purposes. Of these, two are driven wells; six are dug down to the depth of about thirty feet, from which point an augur-bore descends some forty-five or fifty feet further, making a total depth of seventy-five or eighty feet; six others are deep wells, dug in the usual way to the depth just mentioned, and all the remainder are the common shallow wells, ranging in depth generally from twelve to twenty feet. A few have the upper three feet curbed with brick laid in water-lime, but generally no precaution exists against the leaching in of surface water. Some are furnished with pumps of different kinds, the majority being of wood; many of these are in poor condition, the wood being rotten, while the platforms are decayed, loose and open, allowing abundant entrance to bugs, worms and surface drainage.

The wells are placed with great uniformity, sixty or seventy feet

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back from the streets, but their distances from privies vary considerably. Often they are close by, in one instance the space of eight feet only intervening; more than fifty are to be found which are within twenty feet of privies, and in several places I have found drains, or places for surface slops, within six or eight feet, *once within thirty inches.* The average distance from the nearest source of contamination scarcely exceeds thirty feet, and it is not uncommon to find a slop-sodden soil which from lack of care has become nearly if not quite as great a source of possible contamination as a privy or a cesspool.

The soil in most of the settled portion of the ward is a sandy loam, well suited for the rapid absorption of every kind of fluid. Rain leaches into the privies and cesspools, dissolving the matters there fermenting and putrefying, and carries them with it as it percolates through the deeper sand; water from the kitchens, containing vegetable and animal refuse, from the wash-rooms and laundries, containing soap and excreta derived from soiled clothing, finds its way its way into the soil, and to this the drainage from stables and cow sheds is added. * * * On an average, each person passes daily about thirty-four ounces of solid or liquid excreta. The population of the first ward of Racine numbers eighteen hundred persons. Hence, there is a daily amount of three thousand eight hundred and twenty-five pounds, and an annual quantity of considerably more than six hundred tons of such matter produced in this district by the people alone. It is very difficult indeed to make any estimate which shall approach accuracy of the amount of excreta produced from stables, etc., of the other refuse, of slops and kitchen water constantly accumulating, but it must be very large, probably six times the sum above mentioned; this added to the human excreta would make a total of more than four thousand five hundred tons of filth annually deposited upon this sixty acres, all of which is produced within this area. And besides all this, a large amount is brought into the ward from outside sources; for wherever business centres itself, there filth accumulates, and of the sum total of this I can make no estimate whatever. Of course a portion of the whole accumulation is carted away, as, for instance,

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manure heaps and coarse vegetable refuse; the air purifies a certain amount and another part is oxidized in the soil; but notwithstanding these methods of destruction and removal, enough remains to render it certain that the sixty acres contained in the first ward constitute a very thoroughly manured farm.

I have counted forty-one stables, containing one hundred and thirty horses and fourteen cows, two hundred and twenty-six privies, twenty-five cess-pools, twenty-six old stopped-up drains, and at least fifty places where the surface was kept sodden by slops, dirty water, garbage and refuse of all kinds. Note that these three hundred and sixty-eight are existing and in use at this present time, and remember also that for thirty-five or forty years, in this same grouud, cess-pools have been filled in and new ones dug, privy vaults covered over and new ones made, the contents of the old being rarely removed; a little earth being thrown upon them year by year, as the surface settled down, until, as I have ascertained, in certain localities it is almost impossible to dig any kind of hole without coming upon some of these ancient remains, while frequently three or four are found in excavating an ordinary cellar! *And our wells — what of them?* Placed among these accumulations of filth, they become the receptacles of fluids by which they are contaminated, and their water rendered unfit for use. A proof of the ease with which water from the surface finds its way into wells is given by the following fact: Last summer, a small fountain jet from an artesian well was allowed to flow continuously, the water soaking into the ground; a well that was dry, situated at least fifty feet to the north of the jet, soon had an abundance of water, while another well, fully one hundred feet east of the same jet, received water enough entirely to change its character. A common remark is that "the wells fill up when it rains."

I noted six pumps which had cloth bags tied over their spouts to act as strainers for the suspended matters contained in the water, and in five other instances the water was passed through a hand strainer before it came to me for examination. This matter consists of fragments of rotten wood from the pumps or platforms, shreds of vegetable matter, starch grains, flocculent particles of

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undeterminable character, and mud; bugs and worms are not unfrequently pumped up. The water from several wells is no longer used because the people have discovered that it is not fit for use; a few wells furnish water which is used occasionally or after boiling. There are many wells, however, in constant use which ought not to be used a day longer. Prof. Hindley, to whom specimens of water were submitted for analysis, says of some of them, that "*while they may have some little value as manures, as drinking waters they are simply abominable.*"

The use of such water depresses the vital energies and places the human system in a fit condition for the reception (and development) of disease germs. Indeed it may be the vehicle by which germs are carried into the system which in some way or another and under proper conditions cause Diarrhœa, Dysentery, Typhoid Fever, Cholera or Diphtheria. Some of these diseases are occurring from time to time in the first ward, and why not from this very cause? The fact that they are not more frequent affords no proof that there is not danger, or that the danger is not constantly increasing. It is our duty to avert danger and to avert it now, which can be easily done. In a sanitary point of view, there is pressing need for a sufficient supply of pure wholesome water and such supply should be obtained without delay. Many a valuable life will be saved thereby.

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SIXTH

ANNUAL REPORT

OF THE

STATE BOARD OF HEALTH

OF

WISCONSIN.

1881.

MADISON:
DAVID ATWOOD, STATE PRINTER.
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GENERAL REPORT OF THE BOARD.

OFFICE OF THE STATE BOARD OF HEALTH,
WISCONSIN, October 31, 1881.

To his Excellency, W. E. SMITH,
Governor of Wisconsin:

Sir — In accordance with the requirements of the statute under which the State Board of Health is organized, we have the honor to present the following annual report, being the sixth report of the kind since the board was constituted.

At the time when the law organizing this board took effect, there were but ten State Boards of Health in the whole Union, including our own state, and a National Board was rather reckoned among the hopes of advanced sanitary reformers, than as being a project which might become a reality in the near future. But the National Board of Health has given abundant proof of its usefulness during the last two years, and twenty-six state boards now watch over the health of the citizens of as many commonwealths, three having been organized within the year, viz., those of Indiana, New Hampshire and West Virginia.

For a detailed account of the work of this board, and of such other matters of public interest as are legitimately connected with it, we have pleasure in referring you to the report of the secretary, presented herewith. A feature of this report, which we trust will be found valuable, is constituted by the tables which form a part of it, which, while not possessed of the absolute correctness that would be given were the methods of collecting the vital statistics of our state more perfect, still show approximately the extent and distribution of disease in Wisconsin.

Some studies based on these tables, and upon the communications of health officers and clerks of local boards of health which

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accompanied the formal reports of those officers, show that certain diseases have been confined to strictly limited areas, while others, differing in nature, which have occurred either simultaneously or consecutively in the same localities, seemed to be due to identical and local causes.

Although the tables show a larger number of cases of sickness as having occurred during the year, it is not believed that Wisconsin has suffered more than is usual from disease; not only is the number of reports larger than in any preceding year, but greater care has been taken to make the returns as accurate as possible; quite a large number of the officers making them having been at special pains to make a record of all deaths occurring during the year within their jurisdictions, and to send, as an appendix to the formal report, a list of the decedents, giving names, ages and causes of death as far as these could be ascertained. Thus it has come about that the number of cases of sickness and death appears larger than in any former year since the organization of this board, although it is not believed that the percentage of sickness and death has been at all above the average, notwithstanding the prevalence of certain special forms of disease to a somewhat unusual extent in limited districts.

We feel justified, therefore, in saying that the health of the people of the state has been generally good during the entire year, notwithstanding the intense cold of the winter of 1880–81, which bore very heavily upon that portion of our citizens who were somewhat advanced in age; among these an unusually large death-rate was noted, chiefly caused by acute diseases of the respiratory organs, the attacks of which the enfeebled vital powers were unable to withstand.

Among the contagious diseases, concerning which it is our practice to ask for special information,

SMALL POX

has happily been very rare among us during the year, the few cases that have occurred having been, with a single exception, on the very borders of the state; but noting the prevalence of the disease

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in other communities and in foreign countries whence it is frequently brought hither by emigrants, we have felt it incumbent on us to warn our citizens that the immunity which we have thus far enjoyed from the attacks of this direful pestilence can only be continued by making immediate and continued use of the means which medical science has placed in our hands as a safeguard against it. In pursuance of this duty a special circular was issued by us in February last (1881), a copy of which was sent to every health organization, town, city and village in the state, in which the duty of protection in view of a threatened epidemic visitation of this disease was strongly urged. This circular was brought to general notice by the press, and, it is believed, led to the general adoption of such precautions as will greatly contribute to prevent the spread of the disease in our state. A copy of the circular will be found in the secretary's report. It is proper and timely, however, to add that many of our correspondents tell us that they have vainly endeavored to arouse the people of their several localities to a sense of the danger incurred by neglecting the practice of vaccination for their children and re vaccination for themselves. A false security has been engendered by the absence of Small Pox from among us during a few years, and the number of unprotected persons, both old and young, now among us constitutes more than one-third of our entire population. Such a state of things is simply a deliberate invitation to Small Pox — an invitation which we may be very sure will be accepted to our inevitable loss and disaster.

Even though the disease were not upon our borders, it would be highly imprudent, in these days of rapid communication between all parts of the civilized world, to omit taking precautions against it. With the policy that has prevailed in the United States during the whole period of its existence as an independent nation, a policy which we in Wisconsin have steadily supported to our manifest advantage, of inviting the settlement of immigrants within our borders, it is very possible for an individual to be exposed to and contract Small Pox in Europe, the disease developing itself only after the passage of the Atlantic and the railroad journey from the seaboard hither have been accomplished. One instance of this

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kind, indeed, will be recorded in the following pages, and the dissemination of Small Pox germs in this way, with frightful results, is now so easily possible, that it would seem only necessary to call attention to the danger to insure the adoption of efficient measures to guard against it. "In this way a neighboring city was infected by a party of Canadian operatives who brought the disease with them. In like manner an epidemic in Southern Dakota appeared to have been imported by newly arrived immigrants, and Small Pox has been widely distributed moreover by public funerals and other practices common to people ignorant of, or indifferent to the proper treatment of contagious diseases."[1]

If there be any among our citizens who have been deterred from protecting themselves or their children by the assertions sometimes made, that vaccination fails to give protection, or that other diseases are introduced into the system with the vaccine matter, they may be reassured by the following statement of well proven and indubitable facts: 1st. The statistics of all civilized nations show that, prior to the discovery of vaccination, Small Pox was present, not as now, at irregular intervals, sometimes entirely disappearing from a given locality for several years, but existed constantly in all communities, and was looked upon as a disease which no one could escape. It carried off its victims by hundreds of thousands every year, and, no matter what the rank or station in life might be, any one who was not more or less scarred by it was rarely to be seen. The evidences of these facts may be found in any history which treats of the social life of times so recent as the middle of the last century. Medical works, in their discussions of the disease, give abundant testimony to the same state of things. What has brought about so complete a change?

Since vaccination came into general use, epidemics of Small Pox have been growing less frequent, and its once universal and constant prevalence has become only a matter of history. To-day, when the dreaded disorder makes its appearance, who are almost its only victims? Those who have never undergone vaccination, and

[1] From the Scientific American of New York.

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those who have neglected to assure themselves of the continuance of the invulnerability once conferred upon them, by re-vaccination. Just ten years ago (in the winter of 1871–72) an epidemic of Small Pox swept over the city of Philadelphia, costing that metropolis over twenty millions of dollars. The figures relating to the death-rate at that time, as given by the records of the public hospital, are most instructive. "Among 2,377 cases of Small Pox admitted during the epidemic, *only thirty-six* claim to have been re-vaccinated, of which number *only four died.* * * * Of these four cases two occurred among those without cicatrices; one was re-vaccinated after exposure (to Small Pox), and one showed poor and uncharacteristic scars." The records of the Riverside Hospital in the city of New York tell a similar story, as also do those of every part of the world where vaccination is practiced; while in all places where it is rigidly enforced, and every individual is vaccinated and re-vaccinated until his susceptibility is entirely exhausted, Small Pox tends to become an extinct disease, "it is amply proven on the other hand that wherever vaccination falls into neglect Small Pox tends to become again the same frightful pestilence that it was in the days before Jenner's great discovery."

The second objection raised against vaccination is that through it other diseases may be introduced into the system. The burden of proving this assertion rests, of course, on those who make it; but it is well to say here, that among the millions upon whom the operation of vaccination has been performed, the number of well-authenticated instances of any such occurrence is so small as to be absolutely unworthy of consideration in comparison with the vast majority who have been benefited by the immunity from Small Pox conferred upon them. The disease upon which those who oppose vaccination chiefly rest their claim is Syphilis; but any one who has read the startling array of facts in regard to the causation of this malady, brought to public notice by Dr. A. L. Gihon, U. S. N., will be ready to admit that for one chance of its introduction into the system by means of vaccination, there are at least a hundred that it may be contracted in some other and less easily suspected way, and that it would be the height of folly

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to forego the certain protection against Small Pox given by vaccination for the sake of avoiding a danger so trifling. But this negative evidence, valuable though it is, is not all. A special inquiry was instituted in England in 1871 by authority of the House of Commons, at which time the opponents of vaccination had every opportunity and made every effort to prove the assertions freely made by them that vaccination was the cause of various diseases. The very elaborate and copious minutes of evidence then taken furnish exceedingly interesting reading in several respects; it is enough to say here, however, that no single instance of the production of disease by vaccination was proven, the evidence adduced in every case turning out mere hearsay evidence, and coming down, when sifted, to bare assertion, wholly unsupported by any proof. "That is my opinion; there is no doubt in my mind about it," etc., were the conclusions to which the most confident witnesses were driven; and in the only instance in which a strong case seemed to have been made out, close inquiry developed the fact that the disease (Syphilis) claimed to have been caused by vaccination was hereditary. The conclusions to which the committee came, after hearing all the evidence and all the arguments that could be adduced, were as follows:

"That if the operation be properly performed, with due regard to the health of the person vaccinated, and with due precautions in obtaining and using the vaccine lymph, *there need be no apprehension that vaccination will injure health or communicate any disease;*" and

"That it is the duty of the state to endeavor to secure the careful vaccination of the whole population."[1]

DIPHTHERIA,

the second disease on our list, has claimed its quota of victims during the year from almost all quarters of the state, some few counties in the northwestern portion only, failing to make report of its

[1] Vide Blue Book 246 of the House of Commons, of date May 23, 1871.

Attention is called to the note at the end of this report on Small Pox in Wisconsin.

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presence. This fatal malady has for several years engaged the attention of sanitarians generally, both in the Old World and in the New, to a very great extent. While we cannot yet assert that we have the same means of controlling this disease absolutely and certainly which we possess in the case of Small Pox, there is still much that is well established in regard to it, by acting upon which many lives and much suffering might be saved to the community; among the facts well ascertained are the contagiousness of the malady and the value of strict isolation of the sick as a means of securing the safety of the well. Upon these two things this board has always laid great stress, and, until they are well understood and generally practiced, Diphtheria will continue the scourge that it has been in Wisconsin and other states for several years past. The hope that this knowledge will be acted upon before many years does not seem wholly groundless; the wide circulation of the pamphlets issued by the board, and the steady demand for copies thereof, are hopeful features, but constant iteration and reiteration, together with the terribly severe lessons taught by the disease itself, instances of which are recorded in subsequent pages, seem sadly needful yet to enforce the instruction we have anxiously sought to convey. During the past year more than two thousand lives have been sacrificed to this malady in Wisconsin, a number which would cause general dismay were the cause of death Small Pox, Yellow Fever, or some other disease the visits of which are comparatively infrequent, or made at irregular and unexpected intervals; the only reasons for the indifference that now prevails concerning Diphtheria are that it is always among us, and that our people do not recognize the fact that, by isolating every one attacked by it as promptly and as strictly as they now isolate a case of Small Pox, a very important step toward the extinction of Diphtheria epidemics would be taken.

SCARLET FEVER.

Much that has been said of Diphtheria will hold good for this scourge of childhood also. There is this difference, however; that while there are some who doubt the contagiousness of Diphtheria, there are probably very few indeed who question that of Scarlet

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Fever. The number of deaths reported as resulting from this disorder is between five hundred and six hundred. It has shown no marked malignity except in one or two localities, and these, it is worthy of notice, were in a district where the residents insist on close intercommunication with each other, regardless of sickness or health.

A communication from the clerk of a local board of health in connection with his formal report has a special interest in this regard, and we quote from it as follows: "I have been trying to waken our board to some sense of their duty, but have failed to such an extent that one member thereof, who lost a child by Scarlet Fever, had public funeral services held in the town hall, which services were attended largely by the children of the public school! Need it be said that Scarlet Fever prevailed quite extensively thereafter? Notwithstanding this the school went on, although child after child was taken sick and taken away, until at the close of the term only five were in attendance.

"I blame no one, but mention the facts to show the indifference generally prevailing hereabouts in regard to such matters."

It is just this public indifference which constitutes the danger; the facts that parents will allow their children to attend funeral services such as those mentioned above, that the teachers acquiesce in the arrangements, and that a word of warning is so rarely given, are of grave signficance.

Another correspondent speaking of a kindred topic says: "I desire to emphasize one point, i. e., the number of cases of disease originating in our public schools. In this town the schools and school houses were the points from which Scarlet Fever spread, if indeed it did not start from them during the summer of 1880.

"I believe, moreover, that much disease is engendered by the crowding of too many children into small rooms, and rooms which are dirty withal. The school houses stand from one year's end to another and receive no attention from the local authorities the while; they are direct causes of ill-health to very many young men and young women. Such cases attract no attention; they are not brought to the knowledge of your board, for they are not and

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cannot be classed among epidemic or contagious diseases; yet they exist and should be looked to, for they occasion a direct loss of youthful energy and vigor which neither this nor any other community can afford."

In regard to school buildings and their condition we shall speak hereafter; we have other quotations to make from correspondence having relation thereto: the special point of the above note is the spread of disease by means of the public schools, which must continue until teachers and school boards are thoroughly instructed in regard to the danger attendant upon the present loose methods, or rather want of any method for the separation of those suffering under contagious disease from their usual companions and schoolfellows until all danger is past. We here note with pleasure the action taken by the State Teachers' Association at its annual meeting held in Appleton in July last, when the work of this board was set before the members and their co-operation asked in that portion of it which lay more especially with the schools of the state; the committee to which the matter was referred reported "that the subjects of school ventilation, water supply, sewerage, the prevention of contagious disease and all other sanitary measures relating to our schools are of such vital importance that their continued agitation and discussion is demanded; that careful investigation upon these subjects is the duty of teachers, school officers and patrons, and that all interested in the welfare of our schools be urged to study the reports and other publications of the State Board of Health, and to heartily co operate with that board in its efforts in this direction," which report was unanimously adopted as the act of the association. Several of the county superintendents also have shown a decided interest in sanitary work in the public schools, and have, in the circulars of advice and instruction issued for the benefit of the teachers under their jurisdiction, called attention to this, among other matters.

TYPHOID FEVER

has been prevalent to some extent, but it has been light in its visitations. The means by which this disease may be disseminated are

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now so generally understood that it is an evidence of probable neglect whenever it becomes epidemic in any given locality. Among the causes of it which should be promptly suppressed is the far too frequent proximity of the well and the privy-vault or cess-pool. An experienced sanitarian has said that among the customs which tend to perpetuate disease in many places all over America is the practice of digging two holes in the ground, within fifty feet or less of each other, into one of which is poured all the foul, refuse matter produced in a household, while from the other the same household draws all the water used for drinking purposes. It has been so often shown by graphic illustrations, and otherwise, how inevitable is filtration through porous soils, and how little power the soil has to purify any foul fluids filtered through it, that it seems amazing to find so much reliance still placed upon the purity of water that has no other guaranty, and which very cursory examination would show to be badly contaminated. No one fact is perhaps better established than that the soil very speedily loses whatever power it possesses of filtering water, when houses are built upon it and are inhabited; and as the number of inhabitants increases, not only is all power of purification lost, but the reverse power, i. e., that of contamination, is gained, and special precautions are needed to keep out of our wells any water which has percolated through the soil, if we desire to avoid danger to health.

MEASLES AND WHOOPING COUGH

have both been widely prevalent, the number of cases reported of the first named disease having been nearly 12,000, although the deaths have been comparatively few. Of the second disorder about 3,500 cases have been returned. The type of this disease has been somewhat severe, the rate of mortality averaging 2½ per cent.

Quite a number of reports mention the fact that Measles was spread by the lack of any regulations excluding children infected themselves or coming from infected dwellings from the district schools, while, as regards Whooping Cough, the perfect freedom with which the sick were everywhere permitted to mingle with the well was a cause of amazement to every sanitarian under whose

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observation it came. Rules by which those laboring under infectious disorders may be excluded from district schools are much needed everywhere in Wisconsin, but the principle of wholly isolating such patients until they are no longer a source of danger to others should also be understood and rigidly enforced; until this is done we have no reason to wonder that such diseases rage, from time to time, and demand a heavy tax in the shape of child-life.

Dr. West, in his lectures on diseases of children, when speaking of Whooping Cough says: "*So long as a child who has suffered from this disease continues to cough at all, even though it be only once or twice a day, I should be unwilling to restore him to the society of children who have not had the disorder,*" and testimony almost equally strong from other high authority is not lacking on the subject of Measles; many sanitarians indeed regard Measles as anything but a trivial disease in view of the many serious complications which may, and often do, result from it.

OTHER DISEASES.

In addition to the above diseases, concerning which the blanks issued by the executive officer call for as specific and full information as can be given, some others have prevailed, usually in limited districts. The most important of these, at least so far as concerns the serious character of the malady, has been Cerebro-Spinal Meningitis, which is reported from Polk, St. Croix and Dunn counties, where it apparently had its chief seats, extending thence eastwardly as far as Marathon county, where the cases were few and widely scattered. Malarial forms of sickness are reported almost exclusively from along the western and southern borders of the state, where also Diarrhœal and kindred disorders have occurred to some extent, having probably been due to the same causes. Another district which has suffered some from diseases of the latter class comprises the counties which border on Lake Winnebago and others to the west and north of these; there are also one or two small districts containing one or two counties each, the most important of which is in the southeastern part of the state, where enteric disease has been more frequent than usual. Mumps visited

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many localities and appears to have been more severe in its manifestations than is generally the case. For very full statements containing the statistics of sickness in Wisconsin during the year, we refer to the report of the secretary.

SCHOOLS AND SCHOOL HOUSES,

and the effects of the work done in them, still engage the attention of the board, and this must continue to be the case for some time to come. One quotation has already been presented from a communication bearing on this subject, and we here subjoin another: "The school house here stands in a hollow; it is an old frame building, scantily clapboarded, and in its general arrangements it is eminently unpractical, to say the least of it, from a sanitary point of view. The temperature can by no possibility be kept uniform in winter, and the care bestowed on cleanliness may be readily estimated when I say that the building has not been whitewashed even for an indefinite time. The drinking water is always bad, at times not drinkable at all. The privy — one only for both sexes — is entirely too small, is otherwise in bad condition and filthy in the extreme. The children urinate in the corner of the fence close to the road, where every passer-by inhales the sickening odor, and whence the excess of fluid runs back under the school building. I have not failed to call the attention of the school authorities to all these things, and I have withdrawn my own child from attendance at school. Amendment has been promised again and again, but the promises have never yet been fulfilled. I for one am at a loss what to do next or whether to try any longer."

Wisconsin has shown in the most conclusive manner her appreciation of the value of education, and has provided the means whereby every one within her borders may secure its benefits; but in her laudable anxiety to secure intelligent citizens, she has forgotten that strong and healthy physical organizations are quite as essential to the welfare of the state as are vigorous and well trained minds. It must be remembered that during the first twenty years of life the system is called upon for a vast amount of work; it not only has to provide, as in adult life, for the ordinary wear and tear

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of every day, but has to furnish as well the means of growth and development, to build up and consolidate the most complex structure with which we have acquaintance. Just at the time the organism is thus called upon to do double duty, and when it is by consequence peculiarly susceptible of injury and liable to give way before the attacks of organic disease, just when nature calls most loudly for physical freedom and activity, our modern civilization demands that the child shall be subjected to a new strain, that the schools shall take him in hand and begin their important work. One would naturally suppose that under such circumstances as these, with a knowledge of all the facts, with a full consciousness that what the man is to be must depend to a very great extent upon the treatment received by the child, the most thoughtful care, the wisest consideration, the highest and best knowledge that a community can give, would be bestowed upon our schools; that among the first questions asked concerning the qualifications of a teacher would be, "Does he know how to take proper care of those committed to his charge? Can he recognize the physical condition of each individual, and so apportion the amount of study assigned that there shall be no undue strain on mind or body; that while the child is learning what it is essential for him to know, he shall also have a proper amount of physical exercise, of outdoor life, of pure air and sunshine?" As a matter of fact we know but too well that such inquiries as these enter the heads of school officers and committee-men only in very rare instances; the most important if not the only questions being, first, what is the lowest salary at which any one can be hired to do the required work; and, second, will the candidate keep his pupils up to the grade and guarantee that every one of them shall accomplish a given amount of work in a specified time? At last, however, the attention of many parents and the more experienced and considerate among our teachers is becoming drawn to the frequent instances of failing health in children — instances that can be charged to nothing but the pressure under which they must work to keep up with their grades; and, although we fear that the work of reform will be slow, that many a child of brilliant promise must yet be sacrificed to

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the existing system, we trust that we see the beginning of a change for the better, that improvements are now being inaugurated that shall finally lead to a due adjustment of our schools to their ends, to a system in which the kind and amount of study, the conditions and appointments of our school houses and all their surroundings, the physical and mental ability of each individual pupil, and other points of like importance, shall all receive the consideration justly due to them, and in which the child shall be recognized as being of higher value than the grade, rather than as subordinate thereto.

We know well that the whole of this matter is beset with difficulties, and that only by the wisest and most cautious and prudent steps can our schools be brought to even a remote approximation to ideal perfection; but the fact that such difficulties exist furnishes no reason for inaction; rather should it be an incentive to early and earnest study of the whole subject as a prelude to wise and efficient action.

EXTENSION OF THE BOARD'S WORK.

The year has witnessed a very considerable extension of the work of the board. There are now very few towns in the state with the authorities of which the board is not at present in direct communication, more or less satisfactory in character.

Among the communications from such towns is one that sets in so clear a light one class of the difficulties attendant on any attempt to organize and put into efficient operation a local board of health that we give it place at length: "The only acting board of health that this city has had for three years was appointed in June, 1881, and consequently is not qualified to make any report for the year which ended before its powers began. The board, as at present constituted, consists of three members, and we started in with the intention of being very thorough in our work; we really did accomplish some good at the outset, but 'the butchers and bakers and *city law-makers*,' have tried, only too successfully, to control our actions, and we are now at a stand still, *with the prospect of early dissolution.*"

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General Report of the Board.

So far as opposition to thorough going sanitary work is concerned, the above story is a very common one; when the attempt is made to cleanse any Augean stable, many who have some interest, real or supposed, in maintaining its existing condition are stirred up, and there are too many of these in whose view their own personal and private gains rank higher in value than do the health and lives of their fellow citizens. When, moreover, as is often the case, the members of the town board, the city council, or the village trustees, are selected wholly or partly from among those who have interests thus opposed to sanitary reform, the task becomes doubly difficult. Nor is opposition confined to authorities, municipal and other, or to those who think that their financial interests are attacked, directly or indirectly; too often those who are most deeply concerned in the success of sanitary measures, those who will be most immediately and directly benefited thereby, are they who throw the most serious obstacles in the way and are the most decided and energetic in their opposition. The reason for all this is not hard to find; these opponents are very often of foreign birth or parentage, and the struggle for the bare means of subsistence has pressed heavily on them and their ancestors for many generations; hence it has come about that in any proposed change, especially one involving any expenditure for sanitary improvement, they see cause for alarm,— reason to fear that their work will become harder or their resources less. Another class is composed of those who have accumulated property and who fear that sanitary improvements will militate against their interests in this regard. A third, and a very large class, is made up of the ignorant and prejudiced,— the unreasoning who look at any change whatever as unnecessary,— to give their opinion in the words of one of themselves, as "a thing that they don't need; there is no call for it." With these classes of course nothing can be done except by kindly and persistent efforts and by education to overcome their prejudices, and make it clear to them that their livings are not threatened; that their wealth is rendered no less secure by improved sanitary conditions; that the call for such improvements is loud and urgent, and that the improvements themselves, when once made, will speedily mani-

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fest their own value in giving greatly increased health and longer life with all the advantages and blessings attendant thereon.

For those of another class, those who, fully recognizing the need of sanitary work, yet deliberately set their private gains in opposition to reforms which they well know are demanded if the lives and health of their fellow citizens are to be preserved, scarcely any words of condemnation are too strong. When unfortunately it happens that such men are placed in positions in which they exercise powers, municipal or other, whereby the sanitary interests of the community may be advanced or prejudiced, they should be held to a rigid accountability for their manner of using such powers, while abuse thereof should be punished with the utmost severity.

Fortunately, however, all the towns and cities of our state are not in the same situation; the metropolis of Wisconsin has a well organized, active and energetic health department, and some other places have recently made commendable movements looking to the establishment of similar bureaus. Among these is the city of Waupun, where, says the city clerk, "A Board of Health was organized by the appointment of two practicing physicians and one non-professional citizen, with the mayor as chairman and a secretary chosen by the board. This organization was soon abandoned, and the board at present consists of the common council with the city clerk as secretary, and one physician, appointed as health officer by the council, who is paid for services performed. Under a provision of the city charter, rules have been adopted requiring physicians to report all cases of contagious disease, and at the termination of such cases to report either the death or recovery of the patient. Upon receiving a report of any such case, it is the duty of the secretary to serve upon the head of the family in which the same occurs, through the police department, the following notice:

"'—— —— having been reported at your residence, you are required until further notice, 1st. To follow strictly the suggestions made in the pamphlet handed you herewith. 2d. To permit no visitors at your residence, and to allow no member of your family or person living with you to attend church, school or any public gathering. 3d. To allow no attendant on the patient or other per-

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son whose clothing may have become contaminated to leave your premises without first changing or thoroughly disinfecting all clothing worn by such person. 4th. Upon complete recovery and thorough disinfection of your premises, please request your physician to report the same to the secretary of this board, upon which, or other satisfactory proof that your premises have been thoroughly disinfected, these necessary restrictions will be removed.

"'By order of the Board of Health.

"'—— ——, *Secretary.*'

"Such other directions as appear to meet the particular case are also given, including copies of any circulars published by the State Board of Health, such directions being in the pamphlet alluded to in the above order, and the house is placarded. In case of death, the funeral is conducted under the supervision of the health officer, who also exercises a general control of the case so far as the public health is concerned. A penalty of fifty dollars is prescribed in the event of any failure on the part of a physician to report a case of contagious disease, and the same penalty is provided for neglecting or refusing to obey the orders of the Board of Health. Blank forms are also furnished to physicians for their greater convenience in making the reports required."

The regulations described in the above communication might profitably be adopted by every municipal organization in Wisconsin; if this were done, and if the school boards throughout the state were to act concurrently with the local boards of health, and steadily and regularly exclude all children who are themselves affected or who come from dwellings where Scarlet Fever, Diphtheria, Measles, or kindred diseases are known and certified by the medical officer to exist, with the same sedulous care now exercised in case of Small Pox, there cannot be a doubt that even so short a time as a single year would show a marked decrease in the number of cases of such diseases, while a few years' experience would so convince the people generally of the advantages of such measures that probably very few would be found to oppose their impartial enforcement.

"It should not be forgotten that the school and the church are

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two great centres for the communication of contagious diseases," and it behooves us to do all that lies in our power to limit their activity in this direction, while we make every effort to extend the field of their legitimate, proper, and highly desirable operations.

About the fourth of July last many accounts appeared in the columns of the public press of accidents occurring from the use of toy-pistols. These articles are of two or three kinds, some using a cartridge of thin tissue paper enclosing a minute quantity of fulminating powder; others making use of a composition of phosphorus and chlorate of potash similar to that sometimes employed for tipping matches; and others still having cartridges of copper charged with nitro-glycerine, giant-powder, or dynamite, tamped with clay. The first are the least objectionable; but, as a part of the cartridge consists of very fine gravel which may be driven into the eyes by the explosion of the fulminate, they can not be called safe playthings. The second kind, those in which the charge consists of a pellet of phosphorus and chlorate of potash, are objectionable from the fact that the phosphorus is liable to cause burns which are difficult to heal, being poisoned by the acid produced during the combustion, and which leave unsightly scars. It is true that the liability to such accidents may be decreased by a very careful and exact proportioning of the ingredients of which the cartridges are composed, but a knowledge of chemistry sufficient for this is hardly to be looked for among the workmen employed by the manufacturers. The third, however, is doubtless the variety to which the accidents already referred to are due; these accidents are always very severe, and in several instances have ended fatally. Their cause is briefly this: into all explosions the element of time enters to a greater extent than is usually suspected, and on the rapidity with which combustion occurs depends very often the amount of damage done, or rather whether any mischief at all shall result. Gunpowder, which seems to explode instantaneously, is really among the slower of the explosives, and hence it may be used with a greater measure of safety than almost any other. Gun-cotton is variable in its action, and may be rendered slow or quick at pleasure; the fulminates are very rapid, while nitro-glycerine is

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almost uncontrollable — a property which at once gives rise to some of its most valuable applications and renders it especially dangerous in incautious or inexperienced hands. A drop or two of nitroglycerine placed in a thin copper shell in company with a minute portion of fulminate, and covered with clay, constitutes the cartridge furnished with the toy-pistols to which the serious accidents have been owing; this cartridge is placed in a roughly constructed barrel, usually made of cast-iron, fitted with a hammer which is forced down upon the cartridge by means of a tolerably powerful spring. The explosion frequently bursts the thin copper shell instead of driving the clay pellet out through the barrel, and fragments of the metal are driven into, or through the palm of the hand, or into the large muscles on which the action of the thumb depends. Every surgeon knows that lock-jaw or tetanus is peculiarly liable to result from gun-shot wounds of the hands or feet, and many sad illustrations of the fact were given in the columns of the Wisconsin press about the time heretofore mentioned.

We learned from our correspondents that the sale of these toy pistols was prohibited in several places, but in the large majority of our towns and cities no action was taken, and children were allowed to purchase the dangerous playthings and to run the risk of pain, mutilation and death in one of its most frightful forms for the advantage of thoughtless or unscrupulous men.

PAPERS ACCOMPANYING THE REPORT.

In accordance with its custom in preceding years, the board has called upon competent writers outside of its own body for assistance — a practice which the results thus far have fully justified. The papers presented herewith will, it is confidently believed, compare favorably with any that have been presented hitherto.

Among them is one from the pen of a lady well known in our state for her valuable work in charitable and philanthropic fields, Mrs. W. P. Lynde, who has kindly contributed an article upon

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THE EDUCATION OF THE YOUNG IN HYGIENIC MATTERS,

a subject of great practical importance from every point of view. Mrs Lynde urges that inasmuch as every individual has the care of his own body as soon as he reaches years of discretion, and sometimes sooner, that as every one, moreover, is liable to have some responsibility laid upon him for the welfare of others, that as life may at times depend upon proper action promptly taken, and as knowledge of any kind is not only more easily acquired but more firmly implanted in youth than later in life, means should be provided in our public and other schools for giving hygienic instruction of practical character, and that this should be done, if needful, by excluding some less important matters that now engage a large share of the time and attention of pupils.

Another paper, by Dr. Helen M. Bingham, upon

HYGIENE CLUBS FOR WOMEN,

continues the line of thought opened by Mrs. Lynde, and carries it into a special and practical field. In this paper a method is indicated whereby self-education in hygienic matters may be successfully accomplished, a course of practical study being laid down which may be pursued with great advantage by either small or large organizations in villages and towns. It is to be hoped that the suggestions made in this paper will be carried out in practice very extensively by the women of Wisconsin. Only good results can follow such studies.

A paper of great value has been prepared for this report by Prof. Geo. W. Peckham, upon

THE GROWTH OF CHILDREN.

This paper is illustrated by a series of tables and diagrams similar to those published by the State Board of Health of Massachusetts a few years ago; the material for this paper and its illustrations was obtained only at a great cost of time and labor. The writer in collecting his data and preparing the article had several objects in view. He desired to establish the laws of growth for both sexes from the beginning of school life at four years of age

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to its close — usually at about nineteen — and the difference between the rates of growth in boys and girls. If these rates are found to vary, there are of course many practical modifications in courses of study that should be made to suit the differences. In girls the age of puberty and the time just preceding that age, i. e., from twelve to fourteen years, is a period of excessive growth, during which the organism is taxed to a very high degree to furnish the material therefor; the advent of puberty is also a critical time in the life of girls, "and yet probably throughout the state, it is at this very time that the school work is most trying and most difficult."

The influence of race and of hygienic conditions in modifying the rate of growth was also kept in view. It would seem possible, after fully establishing the curves of growth, to use them as a test of the wisdom of any given system of school management, or of the sanitary condition of a given locality. In the schools of Brussels, Belgium, where a complete system of sanitary inspection is maintained, the rate of growth for each child is ascertained from time to time, this being regarded as a matter of importance and as a fair criterion of methods.

It is very desirable that the amount of work done by children, both in and out of school, should be more accurately known by teachers and parents, but more especially the former, than there is reason to fear is frequently the case. When to the hours of attendance at school are added the hours spent in preparing lessons at home, the time employed at the piano, the embroidery frame, the sewing machine, in doing household work, it is probable that in too many cases the time for proper recreation and out-door exercise is sadly abridged, if not absorbed altogether, and it is hoped that the method of investigation that Prof. Peckham has employed will prove a valuable means of instruction for the instructors.

Another valuable paper has been prepared by Dr. E. W. Bartlett, of Milwaukee, upon

COLOR BLINDNESS,

a subject which has of late attracted special attention, and which will probably come before legislative assemblies with considerable

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frequency in the immediate future. In some countries of Europe, and in several of our own eastern states, it has already been found necessary to guard the traveling public against the dangers arising from this defect of vision, and in all probabilitiy other communities will be obliged to follow the example thus set, and so render life and property safer both by sea and land. Even at this day it is frequently necessary to point out the dangers of color blindness, and in his very full discussion of the subject Dr. Bartlett has not only done this with force and clearness, but has shown what perhaps few outside of the medical profession suspect, how comparatively frequent is its occurrence, and has pointed out very distinctly the measures that must be taken in order to reduce the risks attendant on it to a minimum. His contribution will be read with pleasure and profit by all, but especially by those who are more immediately interested in his subject,— a class which includes all who travel frequently, all who are interested in means of transportation, whether of passengers or freight, and all who ever set foot on a steamboat or a railway train. Every train that is at this moment rushing over the land depends for its own safety and the safety of its passengers on the ability of its engineer promptly to recognize the color of the signals displayed before him. Upon the perfection of the same power in its look-out depends the question, whether every steamer that is now bearing its load of life over the ocean or the great lakes shall reach its destination in security, or shall end its voyage prematurely in disaster and wreck. With interests so important, dependent on a defect so little known, no excuse is needed for thus calling attention to Dr. Bartlett's contribution.

The tobacco question is one that has long engaged attention, not only of sanitarians, but of the general public, and its harmfulness or innocuity is yet far from being decided. Probably among the best methods by which conclusions can ever be reached, is that which has been adopted by Dr. G. F. Witter, with results given at length in a paper upon

THE USE OF TOBACCO,

which will be found in the following pages. Dr. Witter prepared a series of questions well adapted to procure fair and impartial an-

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swers. All "leading questions" were carefully avoided, and especial pains were taken in framing the inquiries to avoid giving any indication of the prejudices of the inquirer. The list of questions thus prepared was printed on large letter sheets, with blank spaces for the replies, and sent to leading physicians in various parts of the state, whose answers were collated and tabulated by Dr. Witter, and form a very valuable contribution to the literature of the subject under discussion. In addition to them, Dr. Witter has expressed his own views in a paper of some length, the whole forming a portion of the report, which will doubtless be read with interest.

In conclusion, we have to express our thanks to the many from whom during the year we have received efficient assistance in carrying out the trust committed to our hands; especially we have to acknowledge the kindness of the leading educators of the state in recommending our work to the consideration of all teachers, and the valuable aid given to us in the prosecution of our inquiries among the schools of the state during his whole term of office as State Superintendent, by Hon. W. C. Whitford. To the medical profession of Wisconsin we have been indebted during the year for prompt and freely-given information concerning sanitary matters, and the health or sickness of many localities, and for help willingly rendered whenever asked for. The press of the state has been of great service in keeping our labors before the people, in reprinting the text of circulars and other publications which we have found it desirable to issue from time to time, and in very many ways it has testified to its interest in our work, and manifested its desire to render that work successful. To our colleagues of other State Boards we acknowledge our indebtedness for frequent communications, and for a free exchange of reports, circulars, etc. To all who have thus shown sympathy with our efforts and a desire to second them, we render once more sincere thanks; and among these special mention must be made of the corps of gentlemen who have acted as correspondents of the board, and who, at considerable trouble to themselves, kept the board informed of many facts which have been of value in the performance

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of its work, and cordial acknowledgment of the assistance thus rendered by them is here made. An invitation is extended to all whs are interested in sanitary science to communicate with the board through its executive officer, or to co-operate in its work in any convenient way.

[NOTE.—The unexpected and unavoidable delay in the publication of this report has given time, since the foregoing pages were written, for the appearance in Wisconsin and many other states of an epidemic of Small Pox, which has prevailed to an extent rarely if ever equaled in the history of epidemics in this country, and has fully maintained the evil character of the disease for malignancy, and demonstrated the remarkable power of its contagion to reach all who are unprotected.

It is not yet possible to say in how many places in Wisconsin it has appeared, brought hither in almost every instance from without, now by immigrants from infected regions, and again by infected clothing or other articles; nor is it possible to prevent its further introduction so long as it exists in other communities with whom our railroads bring us into daily and hourly contact; but wherever it prevails its history is the same; it is the unvaccinated, or the imperfectly vaccinated, who become its victims.

The board has reason for saying, however, that by reason of previous timely warning, the state was found in a condition of preparation for such an epi-emic which has shorn the malady of much of its power. We believe that this condition of readiness was due in large measure to the circular of warning above referred to, and to the general distribution of another, published at a somewhat later date, giving more specific information concerning the disease, and instructions for the management of any case which might be brought into any neighborhood, and urging the importance of measures of prevention. This latter circular has been issued in very large numbers, packages sufficient to supply each family with a copy of it having been freely sent to every community where Small Pox was reported to exist. Personal correspondence with the health authorities in such communities was also inaugurated in every such instance.

In some few localities great negligence resulted in a spread of the disease until the precautions urged by this board were adopted and enforced; but in most instances the fact that a large proportion of the people were already protected by the vaccination so strongly recommended by all sanitarians, combined with the praiseworthy vigilance of the local authorities in urging this measure, and in promptly isolating every case brought from without, was sufficient to arrest the march of the disorder and confine it to the families immediately exposed.

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General Report of the Board.

The present prevalence of Small Pox throughout the United States shows the need of greater vigilance in guarding against it, and makes the present an appropriate time in which to suggest legislation for that purpose. The general sentiment possibly may not favor universal compulsory vaccination, but it certainly seems that it would be wise to make vaccination an essential prerequisite to admission to the public schools, or to any educational institution under the control of the state.]

Very respectfully,

E. L. GRIFFIN,
JOHN FAVILL,
JAMES BINTLIFF,
G. F. WITTER,
H. P. STRONG,
SOLON MARKS,
J. T. REEVE,
State Board of Health.

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SECRETARY'S REPORT.

To the Board of Health and Vital Statistics of the State of Wisconsin:

GENTLEMEN — As secretary and executive officer of the board, I have the honor to present the following, my sixth annual report, for the year ending October 31, 1881.

During the year, no change, either in the membership or in the officers of the board, has been made. At the annual meeting, held at Madison in January, Dr. E. L. Griffin was re-elected president, and the present secretary was continued in office. Dr. S. Marks, whose term of membership expired February 2, 1881, was re-appointed by the governor to fill the vacancy thus occasioned.

The names and addresses of the members of the board as it is at present constituted, with the dates at which their terms of office will expire, are as follows:

J. Favill, M. D., Madison, - - term expires February 2, 1882
E. L. Griffin, M. D., Fond du Lac, term expires February 2, 1883
G. F. Witter, M. D., Grand Rapids, term expires February 2, 1884
H. P. Strong, M. D., Beloit, - term expires February 2, 1885
J. T. Reeve, M. D., Appleton, - term expires February 2, 1886
Gen. J. Bintliff, Darlington, - term expires February 2, 1887
S. Marks, M. D., Milwaukee, - term expires February 2, 1888

At the annual meeting in January, the following standing committees were appointed for the year:

On Finance — Drs. Favill, Marks and Witter.

On Legislation — Gen. Bintliff, Drs. Strong and Witter.

On Printing and Stationery — Drs. Reeve, Favill and Griffin.

On Visitation and Sanitary Inspection of Public Buildings — Gen. Bintliff, Drs. Marks and Reeve, the chairman to be authorized to call to the aid of the committee other members of the board whenever in his judgment such assistance should be necessary.

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Secretary's Report.

These and other committees of the board, appointed for special work, remain unchanged from the preceding year in their membership.

In the correspondence of the secretary's office with the clerks of local boards of health throughout the state, there has been an increase that is decided and gratifying, although of necessity not so large as in preceding years. There are now, as will be seen by reference to the lists which form part of this report, comparatively few towns from which reports are not received, and of these few there are two only which have a population of five thousand, and thirteen only whose population equals two thousand, according to the census of 1880; of the remainder, twenty-three have a population of less than one thousand. It will thus be seen that the work of the board now reaches by far the larger proportion of the million and a half of people who compose the state of Wisconsin. Copies of the circular and blank forms for making returns as they were furnished to each town clerk are here given.

OFFICE OF STATE BOARD OF HEALTH,
APPLETON, WIS., May, 1881.

To the Clerk of the Local Board of Health, or the Town, Village or City Clerk:

DEAR SIR — Enclosed please find blank forms for making your annual report to this office; in asking therefor the State Board of Health takes occasion to acknowledge the fact that every county in Wisconsin was represented in the report of 1880, in many cases every town, city and village responding, while comparatively few in any part of the state failed to make some report. The board returns very sincere thanks to all who have thus co-operated in its effort to enter into correspondence with all local health authorities, especially to those who have favored it with voluntary communications in addition to the information asked for, many of which have shown an intelligent appreciation of sanitary work, and trusts that in its next report no single town will be absent from its list.

Small Pox has visited many of our neighboring states, in several cases with great severity, but Wisconsin has thus far escaped any extended visitation of that dreaded disease; the very few cases that have been reported up to this time, have been imported from without, and owing to the judicious management of the local health authorities, the disease, so far as this board is informed, has not in a single case been allowed to spread beyond the limits of the household in which it first appeared — a very gratifying result, and

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one which clearly illustrates what may be done by means of well-directed and energetic sanitary precaution. The malady is, however, yet so widely prevalent in other states, from which it may readily be brought into Wisconsin, that the board feels great anxiety lest it still find a foothold among us, an anxiety which it trusts is shared by all local boards to such an extent, that they will spare no vigilance to save the several communities whom they represent and whose guardians they are, from such a calamity as an outbreak of Small Pox must inevitably prove.

This board desires particularly to call your attention to the fact that for early and definite knowledge of the progress or appearance of any form of epidemic disease, it is compelled to rely chiefly on the reports received from you as the natural and proper channel for such information, and trusts that you will spare no effort or pains to give such reports all possible fullness and accuracy. The difficulty of so doing is thoroughly understood and appreciated; but your position gives you greater advantages therefor than are possessed by any other officer. Consultation with your local health physician, if one has been appointed in your town, an appointment earnestly and constantly recommended by this board, will enable you to render your report more valuable, especially in regard to the diseases named in the blanks.

Chapters 56 and 57, sections 1410 and 1411 of the revised statutes, provide that in the absence of any specially appointed board of health, the officers of every town, village and city shall be boards of health, and shall, as such, exercise all the powers and perform all the duties prescribed by law.

Under these statutes, whether there be any local provision or not, you are the clerk of the Board of Health in your town, village or city, and one of the duties devolving on you in that capacity is to "report at least once a year to the State Board" of Health the transactions of your local board, and "such facts as shall be required, upon blanks and according to instructions furnished;" and further, "to make special reports whenever you are required to do so." This duty the law demands of you absolutely. Whether the local authorities of your town, village or city have ever assembled and organized as a Board of Health or not is a question which is not considered in this connection. The law is explicit, and requires you in virtue of your office to make the proper returns in any case, and any expenditures for postage, stationery, etc., necessary in connection therewith, is properly chargeable to your official expenses.

Sections 1414, 1415 and 1416 of the revised statutes clothe the Local Health Boards with the most ample powers to do any and every act which may be necessary for the preservation of the public health. They may make any needful rules and regulations, which must be obeyed under heavy penalties; they may enter upon private property and remove or destroy anything there found prejudicial to the health of the community; they may remove any

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person sick with any contagious or infectious disease, or isolate him in any way or by any means which the circumstances of the case may require; they are, in short, the guardians of public health throughout the state, and have the fullest authority to enforce any measures necessary for the safety of public health in their respective jurisdictions.

With these local boards the State Board of Health desires to co-operate, and the provisions of law above quoted are intended to render such co-operation intelligent and efficient. In accordance with them, you will please fill out the accompanying blank and return it to this office as promptly as possible at the close of the year for which the reports are made. Since the labor of compiling and arranging is very great and consumes much time, it is desired that if possible all returns shall be made by the first of June.

As hitherto, duplicate blanks for annual reports are enclosed, one of which when filled out should be placed on file in your own office for future reference, and the other should be returned to this board. Should you desire to make any communication in addition to the formal report it will be gladly received, and will have full consideration; any portion or the whole of it will be regarded as confidential should you so desire, but facts concerning local causes of disease, sanitary measures taken by local authorities, or any matter of general interest as affecting public health, will be especially welcome. In the 4th and 5th annual reports of the board, extracts from such communications have been published, and it is hoped that they will form a feature of future reports which will constantly increase in interest and importance.

The publication of the fifth annual report has been unfortunately greatly delayed; a copy will, however, be mailed to your address to be placed on file in your office as soon after the receipt of your report as is possible. The volume will contain sanitary information and carefully prepared articles, which it is hoped will be of special value and interest to you.

Your attention is invited to the important law passed by the last legislature concerning the spread of contagious diseases, a copy of which is herewith inclosed.

Any of the circulars or other publications of this board will be cheerfully forwarded for gratuitous distribution, upon application to this office. Many thousands of the circulars on Small Pox, Scarlet Fever, Care of Infants, and Diphtheria (the last both in English and German), have been thus distributed in various parts of the state, and this liberal circulation has been, it is believed, productive of much good.

By order of the State Board of Health.

J. T. REEVE, M. D.,
Secretary.

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Secretary's Report.

ANNUAL REPORT OF THE CLERK OF THE BOARD OF HEALTH FOR THE YEAR ENDING MAY 31, 1881.

To the Secretary of the State Board of Health:

SIR — The territory for which this report is made includes the corporate limits of the [1] ——— of ——— in the county of ———, containing about ——— acres of land. Its population numbers about ——— inhabitants, and composed chiefly of [2] ———. Their principal occupation is ———.

About ——— of the land included in the above limits was originally covered with timber, chiefly [4] ———. About ——— still remains covered with timber, and during the last year the timber has been removed from about ——— acres. There are now under cultivation about ——— acres. The nature of the soil is ———, and the crops chiefly raised are ———. It is [3] ——— watered by the following streams and bodies of water, to wit: ———.

I estimate the number of acres of low or wet land from swamps, etc., to be now about ———. The proportion of this land which is capable of being efficiently drained is ———, and the number of acres of originally wet or low land that have been thoroughly drained during the last year is about ———.

In this locality the drinking water is derived chiefly from ———, and the quality of the water is [4] ———; the wells are of the average depth of ——— feet.

The proportion of dwellings having cellars which are wet, either habitually or in wet weather, is ———. There has been [6] ——— improvement in the drainage of cellars during the last year.

The average distance of privies from dwelling houses is ——— feet. The average distance of privies from the source of water supply is ——— feet; the least distance in any known case is ——— feet. There has been [6] ——— greater care exercised in the location, cleaning and disinfection of privies during the last year than in former years.

The diseases which have been most prevalent in this community during the last year have been ———.

Upon the whole, the amount of sickness has been [5] ——— than it has averaged for some years past, and the number of deaths has been [5] ———.

There has been in this [1] ———, during the last year, so far as I can ascertain the facts:

——— cases of, and ——— deaths from Small Pox, and there are now (May 31) sick with this disease ——— cases.

---

[1] Insert township, village, or city.

[2] Give approximate proportion of nationalities represented.

[3] Insert poorly, well, abundantly, etc.

[4] Hard or soft.

[5] Insert greater or less, giving proportion, if possible.

[6] Give the facts in the case.

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Secretary's Report.

——— cases of, and ——— deaths from Diphtheria, and there are now (May 31) sick with this disease ——— cases.

——— cases of, and ——— deaths from Scarlet Fever, and there are now (May 31) sick with this disease ——— cases.

——— cases of, and ——— deaths from Typhoid Fever, and there are now (May 31) sick with this disease ——— cases.

——— cases of, and ——— deaths from Measles, and there are now (May 31) sick with this disease ——— cases.

——— cases of, and ——— deaths from Whooping Cough, and there are now (May 31) sick with this disease ——— cases.

The origin of the above cases so far as known was[1] ———.

The diseases prevailing May 31, 1881, other than those above enumerated, are ———.

This Board of Health has appointed Doctor ——— as its health physician. His P. O. address is ———. He is paid a salary of $——— per year.

During the past year this board has held ——— regular (or special) meetings, and its most important acts have been ———.

My postoffice address is ———.

Dated ———, 1881.

Signature ——— ———,

Clerk of the Board of Health for the[1] ——— *of* ———, *County of* ———, *Wis.*

Additional information written on a separate sheet on matters pertaining to health is desired — especially on the following points:

Reports of any cases of disease clearly traceable to local causes; such as impurity of drinking water from decomposing animal or vegetable matter, unhealthy food, stagnant water, etc.

Reports of any extraordinary amount of sickness or of unusual fatality in special localities. Instances of spread of contagious diseases in any unusual manner, etc.

Reports of cases of sickness or of death, the origin of which is clearly traceable to the occupation of the individuals.

Reports of unusual sickness or fatality among animals.

Instances of injury to life or property from kerosene oil or other explosive burning fluids.

Any cases of sickness among children caused by defects in school houses, overcrowding, overstudy, etc., etc.

Any epidemic spread or supposed to have been spread through schools.

Your opinion as to the principal sources of danger to the health of the citizens in your locality, and suggestions whereby the local causes of disease may be removed, etc.

[1] By importation; from direct exposure, which might have been avoided, etc., etc.

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Please give here your best estimate of the average cost of each case of sickness in your community, including as follows: Medicine and medical attendance, $——; hired assistance, $——; loss of time at its fair value, $——. Also the further cost of each funeral in case of death, $——. (Although great accuracy cannot be expected in the answers to this question, your estimate of the above, however imperfect, is nevertheless desired as having a bearing upon the cost of sickness to the communities and to the state.)

Some interesting information has been given in previous reports in answer to these questions and other which may occur to the writers — all of which is thankfully received.

In accordance with custom hitherto, a complete list of all towns, cities and villages which have made report to this office is here given. Returns from the following counties, thirty-seven in number, are complete: Adams, Ashland, Barron, Bayfield, Buffalo, Burnett, Chippewa, Clark, Crawford, Dodge, Door, Douglas, Dunn, Green, Green Lake, Jefferson, Juneau, Kenosha, LaFayette, Langlade, Marathon, Marinette, Milwaukee, Oconto, Ozaukee, Pepin, Pierce, Polk, Price, Racine, Rock, St. Croix, Shawano, Taylor, Walworth, Washington and Waushara. From each of the following counties one or two towns only are needed to make the returns complete: Calumet, Iowa, Jackson, Kewaunee, La Crosse, Lincoln, Marquette, Monroe, Outagamie, Richland, Sauk, Trempealeau, Winnebago and Wood. From these lists it will be seen that very few counties have failed to make reports which are, as a whole, satisfactory. The number of towns, villages and cities reporting for this year is 897, against 853 in 1880, and 795 in 1879, and with few exceptions the reports are fuller and more complete than ever before.

LIST OF CITIES, TOWNS AND VILLAGES FROM WHICH REPORTS HAVE BEEN RECEIVED FOR THE YEAR ENDING MAY 31, 1881, ALPHABETICALLY ARRANGED.

Adams County — Adams, Big Flat, Dell Prairie, Easton, Jackson, Leola, Lincoln, Monroe, New Chester, New Haven, Preston, Quincy, Richfield, Rome, Springville, Strong's Prairie.

Ashland County — Ashland, Butternut.

Barron County — Barron, Cedar Lake, Clinton, Cumberland

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(village), Dallas, Maple Grove, Prairie Farm, Rice Lake, Shetek, Stanfold, Sumner, Turtle Lake.

Bayfield County — Bayfield.

Brown County — Allouez, Ashwaubenon, Bellevue, Depere (town), Depere (village), Eaton, Glenmore, Green Bay (town), Green Bay (city), Holland, Howard, Humboldt, Lawrence, New Denmark, Pittsfield, Preble, Rockland, Scott, Suamico, West Depere.

Buffalo County — Alma (town), Alma (village), Belvidere, Buffalo (town), Buffalo (city), Canton, Cross, Dover, Fountain City, Gilmanton, Glencoe, Lincoln, Maxville, Milton, Modena, Montana, Naples, Nelson, Waumandee.

Burnett County — Brashaw, Grantsburg, Marshland, Trade Lake, Wood Lake.

Calumet County — Brothertown, Charlestown, Chilton (town), Chilton (city), Harrison, New Holstein, Rantoul, Stockbridge, Woodville.

Chippewa County — Anson, Auburn, Big Bend, Bloomer, Chippewa Falls, Eagle Point, Edson, Flambeau, LaFayette, Sigel, Wheaton.

Clark County — Beaver, Colby, Eaton, Fremont, Grant, Hewitt, Hixon, Levis, Loyal, Lynn, Mayville (including the village of Dorchester), Mentor, Pine Valley, Sherman, Sherwood Forest, Thorp, Unity, Washburn, Warner, Weston, Withee, York.

Columbia County — Arlington, Caledonia, Columbus (town), Columbus (city), Courtland, Dekorra, Fort Winnebago, Leeds, Lewiston, Lodi, Lowville, Marcellon, Newport, Otsego, Pacific, Scott, Springvale, West Point, Wyocena.

Crawford County — Bridgeport, Clayton, Eastman, Freeman, Haney, Marietta, Prairie du Chien, Scott, Seneca, Utica, Wauzeka.

Dane County — Albion, Berry, Black Earth, Blooming Grove, Blue Mounds, Bristol, Christiana, Cottage Grove, Cross Plains, Dane, Deerfield, Dunkirk, Dunn, Fitchburg, Madison (town), Madison (city), Mazomanie, Medina, Montrose, Oregon, Perry, Primrose, Pleasant Springs, Roxbury, Rutland, Springdale, Stoughton,

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Sun Prairie (town), Sun Prairie (village), Vermont, Verona, Vienna, Westport, Windsor, York.

Dodge County — Ashippun, Beaver Dam (town), Beaver Dam (city), Burnett, Calamus, Chester, Clyman, Elba, Emmett, Fox Lake, Hermann, Hubbard, Hustisford, Juneau, Lebanon, Le Roy, Lomira, Lowell, Oak Grove, Portland, Randolph, Rubicon, Shields, Theresa, Trenton, Waupun (city), Westford, Williamstown.

Door County — Bailey's Harbor, Brussels, Clay Banks, Egg Harbor, Forestville, Gardner, Gibraltar, Jacksonport, Liberty Grove, Nasewaupee, Sevastopol, Sturgeon Bay (town), Sturgeon Bay (village), Union, Washington.

Douglas County — Superior.

Dunn County — Colfax, Dunn, Eau Galle, Elk Mound, Grant, Hay River, Knapp, Lucas, Menomonie, New Haven, Otter Creek, Peru, Red Cedar, Rock Creek, Sand Creek, Sheridan, Sherman, Spring Brook, Stanton, Tainter, Tiffany, Weston.

Eau Claire County — Augusta, Drammen, Fairchild, Lincoln, Ludington, Otter Creek, Pleasant Valley, Seymour, Union, Washington.

Fond du Lac County — Ashford, Auburn, Brandon, Byron, Calumet, Eden, Eldorado, Fond du Lac (town), Fond du Lac (city), Forest, Friendship, Metomen, Osceola, Ripon (town), Ripon (city), Springvale, Taycheedah, Waupun.

Grant County — Beetown, Bloomington, Boscobel, Cassville, Castle Rock, Clifton, Ellenboro, Fennimore, Glen Haven, Harrison, Hazel Green, Hickory Grove, Jamestown, Liberty, Lima, Little Grant, Marion, Millville, Mount Ida, Paris, Patch Grove, Smelzer, Waterloo, Wingville, Woodman, Wyalusing.

Green County — Adams, Albany, Brodhead, Brooklyn, Cadiz, Clarno, Decatur, Exeter, Jefferson, Jordan, Monroe (town), Monroe (village), Mt. Pleasant, New Glarus, Spring Grove, Sylvester, Washington, York.

Green Lake County — Berlin, Brooklyn, Green Lake, Kingston, Mackford, Manchester, Marquette, Princeton, Ste. Marie, Seneca.

Iowa County — Arena, Clyde, Dodgeville, Eden, Highland, Lin-

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den, Mifflin, Mineral Point (town), Moscow, Pulaski, Ridgeway, Waldwick, Wyoming.

Jackson County — Albion (including village of Black River Falls), Alma, Franklin, Garden Valley, Hixton, Manchester, Melrose, Millston, Northfield, Springfield, Sullivan.

Jefferson County — Aztalan, Cold Spring, Concord, Farmington, Hebron, Ixonia, Jefferson, Koshkonong, Lake Mills, Milford, Oakland, Palmyra, Sullivan, Sumner, Waterloo (town), Waterloo (village), Watertown (town), Watertown (city).

Juneau County — Armenia, Clearfield, Elroy, Fountain, Germantown, Kildare, Kingston, Lemonweir, Lindina, Lisbon, Lyndon, Marion, Mauston, Necedah, New Lisbon, Orange, Plymouth, Seven Mile Creek, Summit, Wonewoc.

Kenosha County — Brighton, Bristol, Kenosha, Paris, Pleasant Prairie, Randall, Salem, Somers, Wheatland.

Kewaunee County — Ahnapee, Carlton, Franklin, Kewaunee, Lincoln, Montpelier, Pierce, Red River, West Kewaunee.

La Crosse County — Bangor, Barre, Burns, Farmington, Greenfield, Holland, La Crosse, Onalaska, Shelby, Washington.

La Fayette County — Argyle, Belmont, Benton, Blanchard, Darlington, Elk Grove, Fayette, Gratiot, Kendall, Monticello, New Diggings, Seymour, Shullsburg, Wayne, White Oak Springs, Willow Springs, Wiota.

Lincoln County — Ackley, Corning, Merrill, Pine River, Scott.

Langlade County — Antigo, Carpenter, Norwood, Polar, Rolling.

Manitowoc County — Cato, Centreville, Cooperstown, Eaton, Franklin, Gibson, Kossuth, Liberty, Manitowoc (town), Maple Grove, Meeme, Mishicott, Newton, Rockland, Two Creeks, Two Rivers (town), Two Rivers (city).

Marathon County — Bergen, Berlin, Brighton, Easton, Hamburg, Holton, Hull, Knowlton, Maine, Marathon, Mosinee, Rib Falls, Rietbrock, Spencer, Stettin, Texas, Wausau (town), Wausau (city), Wien, Weston.

Marinette County — Marinette, Peshtigo.

Marquette County — Buffalo, Crystal Lake, Douglas, Harris,

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Mecan, Montello, Moundville, Neshkoro, Newton, Oxford, Packwaukee, Shields, Westfield.

Milwaukee County — Franklin, Granville, Greenfield, Lake, Milwaukee (town), Milwaukee (city), Oak Creek, Wauwatosa.

Monroe County — Adrian, Angelo, Byron, Clifton, Glendale, Greenfield, Jefferson, La Fayette, La Grange, Leon, Lincoln, Little Falls, New Lyme, Portland, Ridgeville, Sheldon, Sparta, Tomah (town), Tomah (village), Wellington, Wells, Wilton.

Oconto County — Gillet, How, Little Suamico, Little River, Maple Valley, Oconto (town), Oconto (city), Pensaukee, Stiles.

Outagamie County — Appleton, Black Creek, Bovina, Buchanan, Centre, Cicero, Dale, Deer Creek, Ellington, Freedom, Grand Chute, Greenville, Hortonia, Liberty, Maine, Maple Creek, Osborn, Seymour (town), Seymour (city).

Ozaukee County — Belgium, Cedarburg, Fredonia, Grafton, Mequon, Port Washington, Saukville.

Pepin County — Albany, Durand, Frankfort, Lima, Pepin, Stockholm, Waterville, Waubeck.

Pierce County — Clifton, Diamond Bluff, Ellsworth, El Paso, Gilman, Hartland, Isabelle, Maiden Rock, Martell, Oak Grove, Prescott, River Falls, Rock Elm, Salem, Spring Lake, Trenton, Trimbelle, Union.

Polk County — Alden, Apple River, Balsam Lake, Black Brook, Clam Falls, Clayton, Clear Lake, Eureka, Farmington, Georgetown, Laketown, Lincoln, Lorraine, Luck, Milltown, Osceola, St. Croix Falls, Sterling.

Portage County — Alban, Almond, Amherst, Belmont, Eau Pleine, Grant, Hull, New Hope, Pine Grove, Plover, Sharon, Stevens Point (town), Stevens Point (city), Stockton.

Price County — Brannan, Worcester, Fifield.

Racine County — Burlington, Caledonia, Dover, Mt. Pleasant, Norway, Racine, Raymond, Rochester, Waterford, Yorkville.

Richland County — Akan, Bloom, Buena Vista, Dayton, Eagle, Forest, Henrietta, Ithaca, Marshall, Orion, Richland, Richwood, Rockbridge, Westford, Willow.

Rock County — Avon, Beloit (town), Beloit (city), Bradford,

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Centre, Clinton, Evansville, Fulton, Harmony, Janesville (town), Janesville (city), Johnstown, La Prairie, Lima, Magnolia, Milton, Newark, Plymouth, Porter, Rock, Spring Valley, Turtle, Union.

St. Croix County — Baldwin, Cady, Cylon, Eau Galle, Emerald, Erin Prairie, Forest, Hammond, Hudson (town), Hudson (city), Kinnickinnick, Pleasant Valley, Richmond, Rush River, Star Prairie, Somerset, Springfield, Stanton, St. Joseph, Troy, Warren.

Sauk County — Baraboo, Bear Creek, Dellona, Delton, Excelsior, Fairfield, Franklin, Freedom, Greenfield, Honey Creek, Ironton, La Valle, Merrimack, Prairie du Sac, Reedsburg, Sauk City, Spring Green (town), Spring Green (village), Sumpter, Troy, Washington, Westfield, Winfield.

Shawano County — Almon, Angelica, Belle Plaine, Fairbanks, Green Valley, Grant, Hartland, Herman, Hutchins, Lesser, Maple Grove, Navarino, Pella, Richmond, Seneca, Shawano, Washington, Waukeechon.

Sheboygan County — Greenbush, Herman, Holland, Lima, Mitchell, Mosel, Plymouth (town), Rhine, Sheboygan (town), Sheboygan (city), Sheboygan Falls (town), Sheboygan Falls (village), Sherman, Wilson.

Taylor County — Chelsea, Deer Creek, Little Black, Medford, Westford.

Trempealeau County — Albion, Arcadia, Caledonia, Dodge, Ettrick, Hale, Lincoln, Preston, Pigeon, Sumner, Trempealeau, Unity.

Vernon County — Bergen, Christiana, Coon, Forest, Franklin, Greenwood, Hamburg, Harmony, Jefferson, Kickapoo, Liberty, Stark, Sterling, Union, Viroqua, Webster, Wheatland, Whitestown.

Walworth County — Bloomfield, Darien, Delavan, East Troy, Elkhorn, Geneva, La Fayette, La Grange, Linn, Lyons, Richmond, Sharon, Spring Prairie, Sugar Creek, Troy, Walworth, Whitewater.

Washington County — Addison, Barton, Erin, Farmington, Germantown, Hartford, Jackson, Kewaskum, Polk, Richfield, Schleisingerville, Trenton, Wayne, West Bend (town), West Bend (village).

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Waukesha County — Brookfield, Delafield, Eagle, Lisbon, Merton, Mukwanago, New Berlin, Ottawa, Oconomowoc (town), Oconomowoc (city), Pewaukee, Summit, Vernon, Waukesha (town), Waukesha (village).

Waupaca County — Bear Creek, Caledonia, Dayton, Farmington, Fremont, Helvetia, Lebanon, Lind, Matteson, Royalton, St. Lawrence, Union, Waupaca (town), Waupaca (city).

Waushara County — Aurora, Bloomfield, Coloma, Dakota, Deerfield, Hancock, Leon, Marion, Mt. Morris, Oasis, Plainfield, Poysippi, Richford, Rose, Saxville, Springwater, Warren, Wautoma.

Winnebago County — Algoma, Black Wolf, Clayton, Menasha (town), Menasha (city), Neenah (town), Nekimi, Nepeuskun, Omro, Oshkosh (town), Oshkosh (city), Poygan, Rushford, Utica, Vinland, Winchester, Winneconne, Wolf River.

Wood County — Auburndale, Centralia, Grand Rapids (town), Grand Rapids (city), Lincoln, Marshfield, Port Edwards, Remington, Rudolph, Rock, Saratoga, Seneca, Sigel, Wood.

Although the increase over the number of towns reporting last year is not very great, the increased care manifested in making up the reports, and the general desire on the part of clerks and health officers to have them as full and correct as practicable, are subjects for gratification. It is not probable that there will be any marked increase in the number of reports in the future, the percentage of towns failing to make returns being now only a little over seven per cent. of the whole number of towns in the state.

A list of the towns which have failed to make formal report is appended hereto. Those marked with an asterisk have made no returns whatever in any year up to this time:

Brown County — Fort Howard,* Morrison, Wrightstown.

Calumet County — Brillion.

Columbia County — Fountain Prairie,* Hampden,* Portage, Randolph, Kilbourne.

Dane County — Burke,* Deerfield, Middleton,* Springfield.

Eau Claire County — Bridge Creek,* Brunswick, Eau Claire.

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Fond du Lac County — Alto,* Empire, Lamartine,* Marshfield,* Oakfield,* Rosendale.

Grant County — Lancaster,* Mt. Hope, Muscoda, Platteville, Potosi, Watterstown.*

Iowa County — Mineral Point (city).*

Jackson County — Irving.*

Kewaunee County — Casco.

La Crosse County — Campbell, Hamilton.

Lincoln County — Rock Falls.

Manitowoc County — Manitowoc City, Manitowoc Rapids, Schleswig.

Marquette County — Springfield.*

Monroe County — Oakdale.

Outagamie County — Kaukauna.*

Portage County — Buena Vista,* Lanark,* Linwood.

Richland County — Sylvan.

Sauk County — Woodland.*

Sheboygan County — Lyndon, Plymouth (city), Russell.*

Trempealeau County — Burnside, Gale.*

Vernon County — Clinton, Genoa, Hillsboro.

Waukesha County — Genesee,* Menomonee,* Muskego.

Waupaca County — Dupont, Iola, Larrabee, New London,* Little Wolf, Mukwa, Scandinavia, Weyauwega.

Winnebago County — Neenah (city).

Wood County — Dexter.

At least one of the larger places included in this list has been scourged by Diphtheria and kindred diseases for several years, and has more than once called on this board for advice, which has been willingly rendered whether followed or not. In another case the clerk returned no answer to any communication for two or three years; finally the forms were enclosed in a sealed envelope, addressed to the most important office in the township, and indorsed with a request to the postmaster to forward them to the official in question. This plan succeeded, and the following choice epistle from the clerk was received in answer: "I should like it if the Ligislatures would appropriate about $1000,000 to be dewided be-

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tween the Town clerks for making the 1000 and once reports which are sent to us dayly. They institute Offices and appoint Cummissioners so as to feed a lot of politicians which they need to run Eelections. The Town Clerks has to do the runing picking up Statistics gratis free and for nothing and the cummissioners draws a good salary will (query with?) a few days of actual Labor." This document, which is given *verbatim et literatim*, was written on a scrap of paper apparently torn from the bottom of an old letter, and forwarded as the report from a town of about eighteen hundreed people, and is the only report ever yet received by this board concerning the health and sanitary conditions of the community in question. It is evident that so long as men of such calibre and acquirements are elected to fill responsible positions and perform important duties the board will fail in obtaining the knowledge it seeks and which is important to the due performance of the work committed to its charge. It is happily true that such communications are rarely received; it is due to the gentlemen in contact with whom this office comes most often to say that the efforts of the board are generally heartily seconded when once understood — a fact evidenced by the list of reports above recorded, by the many voluntary communications accompanying them, and by the amount of information drawn from both concerning disease and its distribution through the state.

Widely different from the communication just quoted in tone and spirit is the following, but its tendency is notwithstanding the same:

"*Dear Sir:*— Your card at hand and duly noted. As our Board of Health has never held any meetings, I have no records from which to make such a report as you desire. Our town is generally in good condition, and as it has not lately suffered from any epidemic sickness, the Health Board has not deemed it needful even to effect any formal organization. Hence you will readily perceive the difficulty under which I labor in endeavoring to make any report."

This and the former note are typical documents, showing very well the character and standing of the two principal classes of

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clerks who fail to make returns; one, ignorant, taking office only for the sake of what can be made from it, resenting as an imposition on him personally any duty which lies outside of the narrowest official round; the other, with a larger knowledge and more liberal ideas of the claims of his office, willing and even anxious to do its work to the best of his ability, but through the neglect of other officers unable to gather the asked-for information. The end in both cases is the same.

EXTENT AND DISTRIBUTION OF DISEASE.

The information gained from the reports received has been tabulated, in order clearly to show the following points: 1st. The amount of disease actually reported in the state at large, this being given in Table I. In this table are given the cases occurring outside of the city of Milwaukee, and the figures are drawn from the reports received, unaltered in any particular. Tables IV and V are also based on these reported figures, the one showing the number of cases actually returned from each county, the other the percentage of deaths to population in each county.

TABLE I.

Showing cases of disease as actually reported, excluding the city of Milwaukee.

	Small Pox.	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Measles.	Whooping Cough.
No. of towns reporting ..	9	556	330	274	403	224
No. of cases reported	17	9,714	4,131	1,474	11,727	3,386
No. of deaths reported...	1	2,202	564	238	155	84

In addition to the exact figures given in the above table, there are a number of towns from which come indefinite reports of all the diseases named except Small Pox. These towns being added, and a careful estimate made of the probable number of cases occurring in them, such estimate being based on official reports of

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the prevalence of the various disorders in their respective vicinities, their population and similar data, we have the following table:

TABLE II.

Showing probable number of cases of disease in the state.

	Small Pox.	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Measles.	Whooping Cough.
Towns in which disease occurred	9	624	371	304	466	268
No. of cases	17	10,447	4,357	1,548	12,893	3,523
No. of deaths	1	2,368	596	250	171	88

The above tables give only the statistics of disease outside of the city of Milwaukee, excepting so far as Small Pox is concerned, three out of the seventeen cases of that disease referred to in the tables having occurred in that city.

From the monthly reports of the health commissioner of Milwaukee we take the figures representing the mortality from the six diseases which form the basis of our tables, assuming that the proportion of fatal cases to the whole number was the same in that city as in other parts of the state, and finally, taking into account the towns from which no reports whatever have been received, and estimating the numbers of cases of those diseases in such towns as being proportionate to the numbers occurring in other localities in the same counties, we shall have the following table representing the probable numbers in which the disorders have occurred throughout the whole state during the year.

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Secretary's Report.

TABLE III.

Showing probable number of cases of disease, including the city of Milwaukee.

	Small pox.	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Measles.	Whooping Cough.
Whole No. of towns....	9	638	400	354	484	312
Whole No. of cases.....	17	12,125	6,035	1,762	13,837	3,988
Whole No. of deaths....	1	2,730	827	284	211	98

Making a grand total of thirty-seven thousand seven hundred and fourteen cases of preventable disease, attended by four thousand one hundred and fifty one deaths, the probable expenditure on account thereof, according to the best estimates, having been four million one hundred and eighteen thousand seven hundred and ninety-five dollars, fifty-four cents ($4,118,795.54). This sum is sufficient to pay the whole amount expended in building, equipping and maintaining the two State Hospitals for the Insane, down to December 31, 1880, to pay the salaries of the Governor, State Judiciary and Legislature for a term of three years, and leave a balance of more than $60,000.

In addition to these tables two others are appended; one, as already mentioned, showing the number of cases of the above named diseases that have been reported from each county, the other showing the percentage of deaths in each county to its population; the figures representing the population have been taken from the bulletins of United States census for 1880, which were forwarded to this office by the head of the census bureau as rapidly as they were issued. Diphtheria and Scarlet Fever, the two most fatal of the six maladies, were made the subjects of special calculation, and in a third column the proportion of deaths to population from all six disorders is shown.

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TABLE IV.

Distribution of six diseases in the various counties of Wisconsin.

COUNTIES.	Diptheria.		Scarlet Fever.		Typhoid Fever.		Measles.		Whooping Cough.		Small Pox.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Adams	9	2	72	12	6	1	37	....	....	....	....	....
Ashland	23	7	....	....	....	....	100	1	....	....	....	....
Barron	40	7	81	13	7	....	98	7	18	3	....	....
Bayfield	....	....	....	....	....	....	few	....	....	....	....	....
Brown	417	157	44	18	17	1	82	2	58	2	....	....
Buffalo	100	21	15	....	4	....	112	....	22	....	2	....
Burnett	8	....	....	....	....	....	....	....	....	....	....	....
Calumet	157	30	59	5	49	1	452	2	10	....	....	....
Chippewa	221	80	64	8	30	2	182	2	24	1	....	....
Clark	70	30	158	21	4	1	78	2	2	....	....	....
Columbia	237	35	180	17	1	....	214	..	57	....	....	....
Crawford	51	3	13	9	1	1	280	2	55	3	1	....
Dane	185	31	55	7	34	16	244	14	54	....	....	....
Dodge	301	66	52	12	59	6	802	9	191	2	....	....
Door	386	55	11	1	4	....	17	....	2	1	1	....
Douglas	....	....	....	....	....	....	....	....	....	....	....	....
Dunn	138	36	96	10	19	4	321	5	75	....	....	....
Eau Claire	313	20	333	12	....	....	29	....	....	....	....	....
Fond du Lac	247	43	32	5	26	10	196	6	55	6	2	....
Grant	256	40	2	....	16	....	37	2	86	....	1	....
Green	620	67	131	10	234	13	798	9	49	....	....	....
Green Lake	635	163	95	9	6	....	61	1	8	....	....	....
Iowa	248	124	22	11	43	2	115	1	30	3	....	....
Jackson	45	9	148	26	33	8	83	4	10	....	....	....
Jefferson	85	37	113	28	24	2	482	15	353	18	....	....
Juneau	30	11	19	1	12	4	151	1	68	1	....	....
Kenosha	47	15	17	3	16	2	379	2	57	....	....	....
Kewaunee	142	33	37	2	3	....	39	....	8	8	....	....
La Crosse	70	14	11	2	13	1	90	1	73	....	....	....
La Fayette	112	32	7	....	44	4	12	....	66	4	....	....
Langlade	16	8	....	....	....	....	....	....	....	....	....	....
Lincoln	10	6	....	....	1	1	1	1	....	....	....	....
Manitowoc	152	33	61	8	19	4	135	1	23	....	....	....
Marathon	51	16	87	23	52	12	52	1	59	7	....	....
Marinette	6	6	11	2	21	10	....	....	....	....	3	....
Marquette	198	30	42	7	10	3	13	....	....	....	....	....
Milwaukee	890	210	1384	191	131	24	311	23	46	6	3	....
Monroe	273	98	43	3	58	23	57	2	49	4	....	....

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TABLE IV — *Distribution of six diseases in the various counties of Wisconsin* — continued.

COUNTIES.	Diphtheria.		Scarlet Fever.		Typhoid Fever.		Measles.		Whooping Cough.		Small Pox.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Oconto	33	7	16	...	4	....	71	5	12	....	1	1
Outagamie	303	69	156	26	27	5	460	3	66	....	....	....
Ozaukee	51	14	23	3	22	4	75	2	...	....	....	....
Pepin	15	5	2	....	4	1	16	....	2	...	....	....
Pierce	69	14	24	1	40	4	157	1	407	3	....	....
Polk	185	65	12	1	8	1	61	2	124	2	....	....
Portage	465	81	320	36	5	....	42	..	224	5	....	....
Price	....	....	..	..	....	..	few	....	5	1	....	....
Racine	296	18	50	7	50	3	147	3	14	....	3	....
Richland	40	14	6	...	43	19	74	1	170	1	....	....
Rock	189	11	88	8	24	4	179	3	76	....	....	....
St. Croix	174	34	75	5	57	5	55	2	222	6	....	....
Sauk	233	38	43	4	76	9	405	....	23	....	....	....
Shawano	190	112	87	20	9	..	151	....	6	....	....	....
Sheboygan	310	72	320	26	24	3	145	3	4	....	....	...
Taylor	....	....	18	3	3	....	43	1	1	....	....	....
Trempealeau	118	18	65	1	38	7	865	4	60	....	....	....
Vernon	72	23	43	13	31	7	14	....	51	....	....	....
Walworth	53	12	42	2	27	4	840	2	6	....	....	....
Washington	113	19	50	4	24	5	295	1	21	1	....	....
Waukesha	94	14	41	6	21	5	270	7	29	....	....	....
Waupaca	126	34	201	44	6	....	343	21	43	1	....	....
Waushara	282	57	48	7	12	5	410	....	102	....	....	....
Winnebago	205	60	71	12	33	1	631	....	113	....	...	....
Wood	81	13	146	37	2	1	76	1	30	....	....	....

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Secretary's Report.

TABLE V.

Showing percentage of deaths to population in the various counties of Wisconsin.

COUNTIES.	Population according to U. S. census of 1880.	Percentage of deaths from Diphtheria.	Percentage of deaths from Scarlet Fever.	Percentage of deaths from six zymotic diseases.
Adams[1]	6,741	.003	.018	.023
Ashland[1]	1,559	.044	.000	.051
Barron[1]	7,023	.010	.018	.042
Bayfield[1] (estimated)	564	.000	.000	.035
Brown[1]	34,090	.046	.006	.056
Buffalo[1]	15,528	.014	.000	.014
Burnett[1]	3,140	.000	.000	.000
Calumet	16,631	.023	.004	.036
Chippewa	15,492	.050	.005	.060
Clark[1]	10,715	.027	.019	.050
Columbia	28,065	.013	.007	.021
Crawford[1]	15,644	.002	.006	[2].012
Dane	53,234	.006	.001	.013
Dodge[1]	45,928	.017	.003	.024
Door[1]	11,645	.047	.000	.048
Douglas[1]	655	.000	.000	.000
Dunn[1]	16,818	.021	.006	.032
Eau Claire	19,992	.010	.006	.016
Fond du Lac	46,855	.009	.001	.015
Grant	37,852	.011	.000	.011
Green[1]	21,729	.031	.004	.046
Green Lake[1]	14,481	.113	.006	.120
Iowa	23,628	.053	.005	.059
Jackson	13,285	.007	.015	.038
Jefferson[1]	32,155	.012	.009	.031
Juneau[1]	15,580	.007	.000	.012
Kenosha[1]	18,550	.011	.002	.016
Kewaunee	15,806	.021	.001	.027
La Crosse	27,072	.005	.000	.006
LaFayette[1]	21,278	.015	.000	.018
Langlade[1]	685	.116	.000	.117
Lincoln	2,011	.029	.000	.039
Manitowoc	37,506	.009	.002	.012
Marathon[1]	17,121	.009	.018	.035
Marinette[1]	8,929	.007	.002	.020
Marquette	8,907	.033	.008	.045
Milwaukee[1]	138,523	.015	.014	.033
Monroe	21,606	.045	.001	.060
Oconto[1]	9,848	.008	.000	[2].016
Outagamie	28,716	.024	.009	.036

[1] Returns complete

[2] Including Small Pox.

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TABLE VI — *Showing percentage of deaths to population in the various counties of Wisconsin* — continued.

COUNTIES.	Population according to U. S. census of 1880.	Percentage of deaths from Diphtheria.	Percentage of deaths from Scarlet Fever.	Percentage of deaths from six zymotic diseases.
Ozaukee [1]	15,469	.009	.002	.015
Pepin [1]	6,226	.008	.000	.009
Pierce [1]	17,744	.008	.000	.011
Polk [1]	10,018	.065	.001	.070
Portage	17,731	.060	.024	.080
Price [1] (estimated)]	785	.000	.000	.002
Racine [1]	30,921	.005	.002	.010
Richland	18,174	.007	.000	.019
Rock	38,823	.003	.002	.006
St. Croix [1]	18,956	.017	.002	.027
Sauk	28,729	.013	.001	.017
Shawano [1]	10,371	.108	.019	.127
Sheboygan	34,206	.021	.007	.030
Taylor [1]	2,311	.000	.013	.017
Trempealeau	17,189	.010	.000	.011
Vernon	23,235	.009	.005	.018
Walworth [1]	26,249	.004	.000	.007
Washington [1]	23,442	.008	.002	.012
Waukesha	28,057	.005	.002	.011
Waupaca	20,954	.011	.021	.042
Waushara [1]	12,688	.045	.005	.054
Winnebago	42,741	.014	.002	.017
Wood	8,981	.014	.041	.047

[1] Returns complete.

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The above table is based on the figures actually given, no account being taken of towns from which indefinite reports were received. Had this been done, most counties would have given a larger percentage in the third column, and in some instances, higher figures in all three. In the city of Milwaukee regular monthly reports are made of *the number of deaths* from all diseases, but no record is kept of the number of cases of disease of any class; we have therefore assumed that the proportion of the whole number of cases to those ending fatally was the same in Milwaukee as in other parts of the state — an assumption which probably favors Milwaukee, inasmuch as great density of population is invariably attended by a proportionately increased amount of sickness. Calculation on the basis of an equal rate gives us the result above recorded.

Examination of this table discloses some curious facts in regard to the prevalence and fatality of the diseases on which it is based, in different counties which have the same or nearly the same density of population, and in different counties which have the same or nearly the same numbers of inhabitants without regard to area. Thus taking Douglas and Langlade counties, which have not only very nearly equal density of population, but almost exactly the same number of residents, and comparing them, we have the following figures:

Douglas county, with a population of 655, a density of one individual to every two square miles, had no deaths from any of the six diseases during the year, while Langlade county, with a population almost exactly the same, 685, and a density of residents exactly equal to that of Douglas county, had a death-rate of 0.117 per cent. Whence comes this remarkable difference?

Marinette, Marquette and Wood counties have very nearly equal populations, the numbers being 8,929, 8,907 and 8,981. The death rates appear as 0.020 per cent. for Marinette, 0.045 per cent. for Marquette, and 0.047 per cent. for Wood, figures which seem to tell in favor of a scattered population; but when we compare these counties with others having densities nearly the same, we notice marked discrepancy. Thus comparing Marquette with Crawford

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county, the densities of population being respectively 21.4 and 22 per square mile, we find the death rates to be 0.045 per cent. for the first, and 0.012 per cent. for the second; and placing Wood county in comparison with Adams, Marathon and Shawano, the densities being: Wood, 10.4, Adams, 10, Marathon, 10.4, Shawano, 10.7 per square mile respectively, we have death-rates of 0.047 per cent. for Wood, 0.023 per cent. for Adams, 0.035 per cent. for Marathon, and 0.127 per cent. for Shawano.

For more convenient comparison we have here arranged in tabular form the names of a number of counties with the number of inhabitants per square mile, and the death-rates from the diseases of our tables in each, those counties which are most nearly equal in density of population being grouped together in the first instance; while in the second we have placed in juxtaposition those counties which most nearly approach each other in actual number of residents without regard to area.

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COUNTIES GROUPED WITH REGARD TO DENSITY OF POPULATION.

COUNTIES.	Population per square mile.	Percentage of mortality.	COUNTIES.	Population per square mile.	Percentage of mortality.
Adams	10.	.023	Douglas	0.5	.000
Marathon	10.4	.035	Langlade	0.5	.017
Shawano	10 7	.127	Lincoln	0.5	.039
Wood	10.4	.047			
			Dunn	19.4	.032
Brown	65.5	.056	Juneau	19.7	.012
Manitowoc	65.2	.012	Portage	19.	.080
			Waushara	19.6	.054
Burnett	2.0	.000			
Taylor	2.4	.017	Jefferson	56.	.031
			La Crosse	56.4	.006
Calumet	40.7	.036	Outagamie	55.8	.036
Green Lake	41.	.120			
			Kewaunee	45.3	.027
Chippewa	4.3	.060	Walworth	45.6	.007
Oconto	4.6	.016			
			La Fayette	34.	.018
Clark	8.5	.050	Sauk	34.3	.017
Polk	9.	.070			
			Monroe	24.	.060
Columbia	33.	.021	Trempealeau	23.4	.011
Iowa	32.6	.059			
			Pierce	29.5	.011
Crawford	22.0	.012	Richland	29.3	.019
Marquette	21.4	.045			
			Rock	53.9	.006
Dodge	44.3	.024	Washington	54.2	.012
St. Croix	43.9	.027			
			Vernon	28.3	.018
			Waupaca	27.8	.042

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COUNTIES GROUPED ACCORDING TO POPULATION ONLY.

COUNTIES.	Population.	Per cent. mortality.	COUNTIES.	Population.	Per cent. mortality.
Adams	6,741	.023	Green	21,729	.046
Pepin	6,226	.009	La Fayette	21,278	.018
			Monroe	21,606	.060
Buffalo	15,528	.014			
Chippewa	15,492	.060	Jackson	13,285	.038
Crawford	15,644	.012	Kenosha	13,550	.016
Juneau	15,580	.012			
Kewaunee	15,806	.027	Marinette	8,929	.020
Ozaukee	15,462	.015	Marquette	8,907	.045
			Wood	8,981	.047
Brown	34,090	.056			
Sheboygan	34,206	.030	Outagamie	28,716	.036
			Waukesha	28,957	.011
Clark	10,715	.050	Sauk	28,729	.017
Shawano	10,371	.127			
			Vernon	23,245	.018
Calumet	16,631	.036	Washington	23,442	.012
Dunn	16,818	.032			
			Marathon	17,121	.035
Douglas	655	.000	Trempealeau	17,189	.011
Langlade	685	.117	Pierce	17,744	.011
			Portage	17,731	.080
Grant	37,852	.011			
Manitowoc	37,506	.012			

It is not claimed that these figures are more than approximations to the truth, nor can anything better be obtained so long as the laws which regulate the collection of vital statistics are in their present very imperfect condition. Still, inspection of the records of this office shows such a gratifying and marked increase in the care with which the reports have been made, as to justify the presentation of such tabular views at this time, with the hope of stimulating to still greater care in the near future.

The striking differences shown in the death rates from zymotic disease in localities very nearly equal in density of population, and in different counties having nearly the same number of inhabitants, are well calculated to attract attention, and to lead to the inquiry, why do they exist? As regards more than one county where Diph-

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theria and Scarlet Fever have been prevalent and fatal for several years, an answer to this question may be found in the fact that a large proportion of the inhabitants refuse to believe in the contagious character of prevailing diseases or in the necessity of isolating the patients in cases of Diphtheria, Scarlet Fever, Measles, or other diseases kindred in character. The idea is prevalent among many, moreover, that no escape from such diseases is possible — that they are among the inevitable accompaniments of human growth and development, and hence that the sooner they are over with the better for the individual. In accordance with this belief, whenever one of these disorders appears in the neighborhood where it is held, no care is taken to prevent the children who have not passed through it from exposing themselves, and in some instances they are even deliberately sent or taken into the sick-room. In such spirit visits to those suffering under contagious disease are very frequent and precautions against carrying infection home are very rare. Thus it happens that many causes combine to keep the germs of disease numerous and active, and to spread them broadcast through the community. If these already enumerated are not sufficient, there is yet another, i. e., the custom of holding public funeral services in the event of death from contagious disease, which services are attended very largely by children, who in some cases are selected to act as pall-bearers. It is not unusual, moreover, for the coffin or casket to be opened during the funeral ceremonies, no disinfectants being used, and all present being invited to view the body.

The above is no ideal sketch; were it proper to do so, the names of many towns could be given where every one of the conditions just described exist, and where as a consequence infectious disease is always present; whole counties might be named where five out of six towns report the presence of such diseases in varying proportions year after year, and from which competent observers make reports identical in substance with what has just been said. In the mind of the observant sanitarian, there can exist no doubt that such practices contribute largely to the continued presence of contagious disease, or that careful isolation of the first cases of such

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diseases appearing in any community, with an intelligent application of sanitary laws, would do much to prevent this continued waste of life. Until this is done there will be abundant room for the work of Boards of Health.

Examination of the tables I, II and III, and comparison of them with similar tables published in preceding reports, will show that Diphtheria and Measles have been the most important of the six diseases so far as the number of cases is concerned. There is a popular but fallacious idea that Measles is so trifling a disease in itself that it requires no special care during its course and that its contagion need hardly be avoided. Careful study of the disorder and its sequelæ shows that such is by no means the case; that numerous and serious consequences are apt to follow an attack of Measles, too often making the patients invalids through the rest of life. It should therefore be regarded as a disease to be especially well watched and cared for both during its active stage and for several weeks subsequently.

SMALL POX.

Very early in the present year attention was called to the prevalence of Small Pox in other states, and particularly in Europe. The present means of transit are so rapid that this disease may be, and in many cases has been developed in unsuspecting communities in which immigrants have settled, the malady having been contracted before embarkation for America, and the time occupied by the ocean voyage and land travel from the port of arrival to the new home having been less than the period of its incubation. The danger that Wisconsin would suffer in this way was deemed sufficiently great to require the issue of a special circular calling attention to the facts and warning our citizens and people generally of the peril that threatened them, and accordingly in February last such a circular was published, copies of which were sent to the press throughout the state, to all local health authorities, to the heads of various educational institutions and many others. The full text was as follows:

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Secretary's Report.

OFFICE OF THE STATE BOARD OF HEALTH,

APPLETON, February 7, 1881.

To the Local Health Boards and People of the State of Wisconsin:

The State Board of Health desires to call attention to the fact that Small Pox in an unusually severe and fatal form is now prevalent in many parts of the country.

This state is, happily, still entirely free from this loathsome and dreaded disease, but inasmuch as it is carried with great facility from one place to another by means of the ordinary channels of transportation and travel, such immunity cannot reasonably be expected to continue without the exercise of unusual caution.

The board therefore desires to warn the people that prompt and decided action should be taken for the protection of the state from this disease. No one should allow himself, or any one for whom he is responsible, to remain unvaccinated. It must be remembered that vaccination performed in early life may lose its protective power, and that dependence upon it may prove a fatal delusion. Whenever and wherever Small Pox threatens, re-vaccination by a competent physican should be by all means practiced.

School Boards and Local Boards of Health everywhere should co-operate in requiring vaccination of all children and young persons as a condition of admission to the public schools, and the proprietors of manufacturing establishments of all kinds should urge the necessity of this operation upon their employees.

A great responsibilty rests upon all Local Health Boards and officers, whose imperative duty it is to take every precaution that can be used to prevent the appearance of the disease in the communities where they have control, or in the event of all precautions failing, to use the extensive powers conferred upon them vigorously and wisely, to prevent its spread, by strict isolation of any and all infected persons. On three several occasions during the last year Small Pox was imported into the state, and by the prompt exercise of this precaution it was confined in each case to the family into which it was thus brought.

The State Board of Health holds itself in readiness to act with the Local Boards to the full extent of its powers, and to advise and counsel to the best of its ability. Circulars containing instructions for the management of the disease will be sent to any address upon application to the secretary.

By order of the State Board of Health.

J. T. REEVE, M. D.,
Secretary.

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Secretary's Report.

The warning and advice thus given have been, it is believed, of great service to the people of the state; the circular was widely published by the newspaper press, and the importance of its subject urged upon public attention in such a way that many were led to protect themselves from the disease by timely vaccination; while local health authorities, forewarned by it, were put on the alert to meet any emergency that might arise. The result has been that to this date Wisconsin has suffered from Small Pox but slightly in comparison with other states; our tables show that during the year ending May 31, ult., there were but seventeen cases in the entire state, the disease terminating fatally in but one instance. In four places by the judicious action of the local authorities the malady was confined to the single individual in whom it originated; two other localities had each two cases, and three others had three cases each. It may justly be said of all that good sanitary management was the only means by which those towns were saved from an epidemic visitation of the dreaded disorder.

The increasing prevalence of Small Pox throughout the country, and the alarming number of cases that were developed among immigrants newly arrived from foreign countries, aroused health organizations generally, and led to a conference of health boards at Chicago on the 29th and 30th of June last, at which were present representatives of the national board, the state boards of Illinois, Indiana, Iowa, Maryland, Michigan, Minnesota, New York and Wisconsin, and the local boards of Baltimore, Buffalo, Chicago and Milwaukee, Dr. H. P. Strong serving as the representative of this board. After a full interchange of views the conference presented a statement which set forth the existing state of facts respecting the general prevalence of Small Pox in foreign countries and at various points in the United States, and unanimously adopted a series of resolutions:

1st. Calling for concerted and energetic measures on the part of all health boards to avert the threatening danger of a wide-spread dissemination of that disease by means of the immense number of unprotected immigrants daily landing at our seaports and immediately proceeding to inland districts.

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2d. Recommending such national legislation as will incorporate into the laws regulating immigration a provision requiring protection from Small Pox by means of the successful vaccination of all emigrants.

3d. Recommending that the National Board of Health consider the propriety of making and enforcing rules requiring inspection of all emigrants for the United States at the port of departure, and the vaccination of all who may be found unprotected.

4th. That notification be sent to the various steamship companies bringing emigrants to this country that unless satisfactory evidence of vaccination is furnished in case of each immigrant arriving at any port of the United States, the vessels should be quarantined for a time sufficient to insure the development of all cases of Small Pox that may be latent among their passengers; and,

5th. That local health authorities should cause thorough inspection of immigrants at all distributing points.

These resolutions have been cordially indorsed by this board.[1]

[1] Note, December, 1881. The happy immunity from Small Pox enjoyed by Wisconsin, as above referred to, continued for some time after the conference and up to the date of this report. A delay in its publication makes it proper for me to add here that the disease has since appeared in several places in the state, brought hither, in every instance that can be traced, from without our own limits by means of immigrants or by visitors from infected districts. From this danger it was of course beyond hope that we could remain free so long as Small Pox existed in places with which we were in constant communication and had continual business relations. It gives me great pleasure, however, to be able to say that while the disorder has thus been brought to us in several instances (which will be proper subjects of detailed reference in a subsequent report), the vigilance of local authorities has generally been such that the pestilence has been shorn of its terrors, and has been arrested in nearly every instance in the household in which it first made its appearance. It is proper for me to add in this connection that wherever Small Pox has been reported as present, special communication has been opened with the authorities, and a circular giving directions for the restriction and general management of the disease has been sent in large quantities. Copies of this circular have also been sent to many other places in the state in numbers sufficient to place one in the hands of every family. A copy of the latest edition is appended hereto. Thanks are due to the press of the state for aid in making it known by liberal quotations from it, and by other means:

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Secretary's Report.

SMALL POX.

Small Pox is caused by a specific poison which has the power of reproducing and multiplying itself to an extent that is practically unlimited.

Less than a century ago one-tenth of all the deaths that occurred in Europe were due to Small Pox, and so few escaped its attacks that more than one-half of the living were scarred and disfigured by it. Nor was this record peculiar to Europe; everywhere Small Pox has been one of the most destructive, as it is one of the most loathsome of diseases, and were it not for the discovery of a means whereby its ravages may be prevented, it would still decimate the human race. This discovery is of comparatively recent date. Two years before the close of the last century, Jenner, an English physician, who for many years had been studying the subject, announced that the virus of Cow Pox — a spontaneous disease of the cow — was capable of producing in the human system a specific disease, which, being transmitted by inoculation from individual to individual, gave to each a degree of protection from subsequent attacks of Small Pox as perfect as that afforded by an attack of the disease itself.

The value of this discovery has been attested in the experience of millions since that time, and solely by reason of its extended application such fearful epidemics of Small Pox as prevailed up to the end of the last century are now unknown. Indeed, no fact seems better established than that vaccination will protect against Small Pox; yet against vaccination two arguments are frequently urged; first, that it is sometimes ineffectual, and second, that it may sometimes communicate other diseases. That so-called vaccination performed by unskilled operators with matter from improper sources, may be and often is unprotective, cannot be doubted. The apparent simplicity of the operation has led many to believe that it may be performed by any one, and thus it has often happened that unskillful operators, unable to distinguish a true and typical vesicle from a spurious one, have vaccinated with matter which has produced sores that have been mistaken for genuine vaccine sores, but which have really been wholly unprotective and sometimes dangerous. Such vaccination is very largely responsible for whatever of public distrust there may be, either of the efficiency or the safety of the operation. That true vaccination is effective in preventing Small Pox has been proven by such convincing evidence that only those unfamiliar with the facts or unwilling to accept conclusive proofs can doubt it, and the danger of communicating any disease by the proper performance of vaccination is so exceedingly slight as to be unworthy of serious consideration when weighed against the benefit to be derived from the operation; but it is possible to render vaccination entirely void of this danger by the use of fresh and carefully selected Bovine Virus, and by perfect cleanliness of the instrument employed.

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Secretary's Report.

Small Pox is pre-eminently a preventable disease, but it is so simply because of vaccination; neither cleanliness, purity of air, or the use of disinfectants of any kind, however valuable these may be in themselves or as adjuncts, are to be relied upon for a moment to neutralize the powerful contagion of this malady which will attack nearly every unvaccinated person who may be exposed to it. We therefore urge upon the people of Wisconsin the advice to have themselves and their children protected from Small Pox by means of the vaccination or re-vaccination of every person upon whom this operation has not been recently and successfully performed.

But while the protective power of vaccination as against every form of variolous disease is entitled to unqualified confidence, three conditions must be carefully observed to secure such protection:

1st. *The virus used must be vigorous and pure.* Enfeebled or deteriorated or improperly selected virus may produce spurious and wholly unprotecting sores. At best they gave but an imperfect development of the vaccine disease, hence lead to a feeling of false security, and not unfrequently bring unjust discredit upon the operation.

We recommend the use of *pure and fresh bovine virus* as producing the maximum of protective influence, and being always available in any quantity needed.

2d. *The operation must be skillfully and properly performed.* The careless and imperfect manner in which vaccination is often performed, and the entire lack of watchfulness of the result, or knowledge as to whether there has resulted a genuine, typical vesicle, is a grievous mistake. The operation should be conscientiously performed, and the development thereof carefully observed until it is *known* to be protective, or until by frequently repeated operations it is proven that the vaccine disease cannot be established. It is a mistake to postpone vaccination until an epidemic appears, for it may then be done hastily and without opportunity to watch properly its perfect development.

3d. *Re-vaccination should be frequently practiced* to test the returning susceptibility of the system to Small Pox contagion.

By a strict and universal observance of these rules we believe that Small Pox epidemics and the fear of them would cease to exist. To neglect these precautions is to endanger not only the life of him who neglects them but also the lives of those with whom he associates. We believe there is no valid excuse for such neglect. If one does not fear the disease for himself he has no right to permit himself to be a possible source of danger to others

With regard to re-vaccination the facts are, that a certain number of persons are protected for life by one vaccination, while the protection of others extends to but a limited and variable period. Hence, as we are without the power to distinguish between these classes, re-vaccination is as essential as a

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primary operation. It should be performed at every season of an epidemic diffusion of the disease, and it is prudent to repeat it at intervals of a few years even though no epidemic prevails.

We earnestly recommend that local boards of health throughout the state, take measures to secure the vaccination of all children in attendance upon the public schools, who have not been vaccinated within five years, and that they use their influence to impress this duty upon all citizens, and we advise as a measure of wise economy that this be done at public expense wherever it may be necessary to insure its thorough performance.

Should Small Pox unfortunately appear in any community, we earnestly recommend the adoption of the following rules:

Isolation.

Thoroughly isolate and quarantine every case that may occur, and keep it so isolated until all danger that the disease can be communicated is past. If the patients cannot be removed at once to a hospital, and must be kept in a private house, it is better that the uppermost rooms of the house be used for the purpose, from which every needless article should at once be removed. Every person in the vicinity should at once be vaccinated without regard to previous operations. No persons except those absolutely necessary for the care of the sick should be admitted to the room or house, and nothing should be taken from either except under regulations prescribed by the attending physician or health officer. Discharges from the body of the patient should be burned, or buried remote from any well or source of water supply.

In case of death, the funeral and burial should be conducted with the strictest privacy, and should be under the direction of the health officer.

Disinfection.

During the sickness the greatest care must be taken to disinfect all articles removed from the sick room so that they cannot carry contagion elsewhere. Among the simplest and best of the many disinfectants recommended are, one-half pound sulphate of zinc, one ounce carbolic acid and three gallons of water, into which all soiled clothes and bedding may be at once put to soak till they can be disinfected by boiling; and two pounds or more of copperas dissolved in one gallon of hot water, which is to be used plentifully in all vessels which receive the discharges from the bowels and bladder. All sweepings and similar refuse from the sick room should be burned.

At the close of the disease, it is better that all infected bedding, clothing, carpets, etc., be burned. If their value is too great to admit of this sacrifice, they may be disinfected by being thoroughly boiled in water or by being baked in an oven at a temperature of not less than two hundred and fifty degrees, F. Heat effectually destroys the poison germ. Such articles as can-

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not be so treated should be opened out in the room after the removal of the patient and be subjected to sulphurous fumigation, which is effected by placing sulphur in the room in a safe and convenient vessel, in the proportion of eighteen to twenty ounces for each thousand cubic feet of space, with the doors, windows and chimney flues closed, and igniting it. The room should remain closed ten or twelve hours, after which prolonged ventilation, scrubbing the floor, and painting the wood work, with whitewashing and re-papering the walls, will complete the process and fit the rooms for re-habitation.

In the interests of public health the person receiving this circular is respectfully requested to aid in giving circulation to the information it contains, and it will be esteemed a favor if immediate notice be given this board of any outbreak of the disease.

By order of the board,

J. T. REEVE, M. D.,
Secretary.

DIPHTHERIA

is reported from 556 towns, in 116 of which it appears on the returns as having been the only prevailing disease, while in the remainder it has been accompanied by one or more of the maladies concerning which special inquiry is made. The northwestern portion of the state seems to have been, generally, most free from its visitations; the returns from Bayfield, Douglas, Price and Taylor counties making no mention of it at all; while in Burnett county, a single town only is reported as suffering from it. In Green Lake and Monroe counties, it has been severe; and the same may be said of pretty large portions of Brown, Calumet, Chippewa, Dane, Shawano and Sheboygan counties; the settled parts of Langlade county; of three or four towns in each of Grant, Polk, Portage, St. Croix, Waushara and Winnebago counties; two or three towns in each of Door, Dunn, Green, Milwaukee and Outagamie counties; and one or two towns in each of Dodge, Iowa, La Fayette, Manitowoc, Marathon, Marinette, Marquette, Pierce, Richland, Sauk, Trempealeau, Waupaca and Wood counties. Over the remainder of the state, where it has occurred at all, it seems to have been comparatively light.

In estimating the severity of the disease, regard has been had to two points especially; first, the number of cases reported as com-

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pared with the number of inhabitants; and second, the percentage of mortality.

The whole number of cases of Diphtheria reported for the year was 9,714, with 2,202 deaths, the average rate of mortality being about 22.66 per cent.; thus indicating a more severe type of the disease than in the preceding year, during which the reported mortality was about 20 per cent.

SCARLET FEVER

is reported as having been somewhat more widely distributed than during the year ending May 31, 1880; and the rate of mortality has been higher, being 13.8 per cent. during 1880–81, as against 12.09 per cent. during 1879–80. Ashland, Bayfield, Burnett, Douglas, Langlade, Lincoln and Price counties report no cases of the disease within their boundaries; and it seems to have exhibited marked malignity at a single place only. The reported cases number 4,131, with 564 deaths.

TYPHOID FEVER,

also reported as rather widely distributed, has apparently been much milder in character than in former years, the mortality resulting from it being reported at 16.14 per cent., as against 20.6 per cent. in 1879–80. Dane, Dodge, Fond du Lac, Green, Iowa, Jackson, La Fayette, Marathon, Monroe, Pierce, Racine, Richland, St. Croix, Sauk, Trempealeau, Vernon, Walworth and Winnebago counties seem to have been the principal seats of this disease; while Barron, Buffalo, Clark, Columbia, Crawford, Door, Green Lake, Kewaunee, Lincoln, Marinette, Oconto, Pepin, Taylor and Wood counties have been lightly visited; and Ashland, Bayfield, Burnett, Douglas, Eau Claire, Langlade and Price counties have apparently escaped unscathed. The number of cases reported is 1,474, with 238 deaths.

MEASLES

seems to have been more widely prevalent all over the state than during former years, but the rate of mortality has been a trifle lower than during '79–80, being 1.33 per cent. for the current year,

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against 1.5 per cent. for the year preceding. Price county alone reports no case of the disease as occurring within its limits; Dane, Jefferson and Waupaca counties seem to have suffered most heavily from it, while Dodge, Dunn, Fond du Lac, Oconto and Waukesha counties report each three or four towns where it has been severe. The number of cases is reported at 11,727, and the number of deaths at 155. This malady has been accounted severe when the mortality resulting therefrom has been two per cent. or over.

WHOOPING COUGH

also has apparently been more severe than formerly, the mortality from it being returned at 2.5 per cent. in 1880–81, against 1.75 per cent. in 1879–80. Iowa, Jefferson, La Fayette, Pierce, Polk, Portage and St. Croix counties are reported as having been most severely affected; while Brown, Crawford, Dodge, Fond du Lac, Grant, Juneau, Kewaunee, La Fayette, Marathon, Monroe, Richland, Vernon, Washington and Waupaca have suffered in a lower degree. Ashland, Bayfield, Douglas, Langlade and Lincoln counties report no cases at all within their limits; while Burnett, the northern part of Chippewa, Clark, Door, Marinette, Oconto, Price, Taylor, Shawano, Waushara and Wood counties have been visited with comparative lightness. From Kewaunee county only one town is reported in which Whooping Cough occurred, and from that town only the number of deaths from the disease is returned, with the statement that it prevailed among infant children extensively and was very fatal. This disorder has been reckoned severe when the mortality resulting from it has been reported at one per cent. or more. The whole number of cases is reported at 3,388, with 84 deaths.

After the disorders which are made the regular and special annual subjects of inquiry, and of which as full, specific returns as can be made are called for, pulmonary diseases generally seem to have been of the most frequent occurrence during the year. From 122 towns the report is made that Pneumonia has been exceptionally prevalent during the year, while about an equal number report other bronchial and pulmonary diseases as having been rife

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among them. Without doubt the unusual severity of the winter of 1880–81 has been the cause of much sickness of this character, and also the reason of another circumstance noted in quite a large proportion of the returns — i. e., the increased number of deaths among the old. A season in which, as early as November, the thermometer fell to thirty degrees below the freezing point, and in which during the whole of that month the average temperature at Milwaukee was about five degrees below that point — a season in which a descent of the mercury very far below zero was of exceptionally frequent occurrence, and when an increase in the velocity of the wind from a perfect calm to 36 and 37 miles per hour within twenty-four hours was often recorded, is especially favorable to inducing pulmonary difficulties, and is also peculiarly trying to the feeble vitality necessarily attendant on advanced age.

MALARIAL DISEASES

are mentioned as having prevailed to an unusual extent in sixty five towns. With very few exceptions these localities are on the western and southern borders of the state, beginning at Buffalo county on the Mississippi, and extending thence southward to Grant county; here the line turns toward the east, running in that direction to Walworth county, passing thence into Jefferson county, from which it retrogrades through Dane, Iowa, Richland, Sauk and Juneau counties, in the last named of which cases have been few. Detached stations, so to speak, are formed by Ozaukee and Washington counties, and by Fond du Lac, Waushara and Winnebago counties. No malarial disease is reported from any other portion of the state.

CEREBRO-SPINAL MENINGITIS

has occurred in twenty-five towns, but excepting in a single instance, nothing very definite is reported by any one concerning the the number of cases or the rate of mortality. The district in which the disease has been most severe comprises Chippewa, Clark, Dunn, Marathon, Polk, St. Croix, Taylor and Wood counties; the larger part of the cases have appeared in Dunn, Polk and St. Croix counties; in the other counties mentioned the disorder has been com

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paratively mild. Dane and Monroe counties each report two towns where it has appeared, the two in Dane county being contiguous, while those of Monroe county are widely separated.

MUMPS.

This disease, popularly reckoned among the trifling disorders through which children must inevitably pass, has been reported as occurring with some severity in fifty-six towns. The whole territory over which it has prevailed is divided into three districts, one comprising Barron, Buffalo, Chippewa, Clark, Dunn, Jackson, La Crosse, Pierce, Polk, Taylor, Trempealeau and Vernon counties, a second taking in Adams, Columbia, Dane, Fond du Lac, Green Lake, Portage, Waupaca, Waushara and Winnebago counties, and a third embracing Kenosha, Racine and Walworth counties. It is perhaps worthy of notice that the first of these districts is also one in which Cerebro-Spinal Meningitis was most severe. In several towns both of these diseases occurred during the year, but whether they appeared simultaneously or consecutively the reports do not show. It should be generally known that the specific inflammation on which Mumps depends does at times extend to the membranes enveloping the brain and spinal cord, a fact which indicates that greater care and attention than is frequently bestowed should be given to children or others suffering under this complaint.

DIARRHŒA,

with Dysentery and kindred affections, including Cholera Infantum, has been prevalent in the counties of Calumet, Fond du Lac, Portage, Shawano, Waupaca, Waushara and Winnebago; in Iowa, La Fayette, Richland and Sauk counties, where it will be observed that malarial disease has also prevailed, and in a third district composed of Buffalo, Jackson and Trempealeau counties: Chippewa and St. Croix counties also report these disorders to a very limited extent. Diseases of this character have been exceedingly mild during the year in the whole of Wisconsin.

Upon the whole the people of Wisconsin may be congratulated on the degree of health that they have enjoyed during the year. No single disease has ravaged the state as a whole, and although

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the number of cases of certain diseases is larger than has been reported hitherto, the increase is due to the increased number of returns received, and to the greater pains taken and the more careful inquiry made by the local authorities in regard to the facts.

Among the brief notes appended in many instances to reports, such as the following are frequent and of special interest: "Scarlet Fever and Measles originated in every instance from direct exposure which might have been avoided." "Much disease had its origin in damp cellars and bad water." "Small Pox was brought here by an immigrant who probably contracted it in Europe." "Impure water and bad drainage caused much sickness." "Diphtheria was brought here probably by some rags which were imported by a peddler." "The deaths from Diphtheria, which were all in one family, were caused by infected clothing brought from another state, where a son had died from this disease." "Diphtheria was spread by promiscuous visiting of the sick." "Measles was spread by means of a masquerade."

The introduction of Small Pox by immigrants furnishes a striking illustration of one of the dangers incident to modern improvements in rapid inter-communication,—the danger of spreading contagious diseases, which has for some time engaged the attention of sanitarians, and from which only combined action on the part of national, state and local health authorities can give protection. At least one case, it is said, has occurred, in which, for want of such co-operation, a number of newly-arrived immigrants among whom Small Pox had broken out on shipboard, were taken away from the jurisdiction of the health authorities at the port where a landing was first attempted, to a point in an adjoining state, where they were openly transferred to a train provided by the transportation company, and as quickly as possible despatched to their destination.

The excellent law entitled "an act to prevent the spreading of Contagious Disease," elsewhere printed at length, would be, if enforced, efficient to protect our citizens from the consequences of such recklessness to a certain extent, but, as already said, nothing but

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concerted action on the part of both state and local health authorities can give complete security.

LOCAL HEALTH BOARDS.

Among the great needs of our state from a sanitary point of view is that of a well-organized system of Local Boards of Health. Of the nine hundred towns and cities now in communication with this office, very few enjoy the advantage, which all should enjoy, of the services of an active and efficient Health Officer, acting as the executive of an intelligent local board. One consequence of this lack, and that which most nearly concerns this board, is that the information received, valuable and trustworthy as it is in the majority of instances, comes not as an official utterance based on authoritative data, but rests solely on individual responsibility, and hence does not carry the weight to which it is entitled, and might otherwise have. Another consequence, and that which most nearly concerns the people of the state, comes from the fact that under the statutes of Wisconsin the local authorities are those to whose care the public health is directly committed; to them are granted powers that are almost without limit, and are amply sufficient to prevent the general spread of any contagious or infectious disease, and they are therefore directly responsible whenever such diseases spread through any given community. Hence, when no organization as a board of health has been effected, the people are without the protection which it is the design of the statute to give, and hence when any emergency arises demanding prompt and decisive action on the part of the local board, and such action may, under existing circumstances, be required at almost any moment, in any part of the state, it cannot be taken because the body whose province it is to act has no legal existence.

The statute has been referred to in general terms and in substance has been given in a preceding report, but it is presented here in full in order that the whole extent of the authority conferred by it may be seen. It forms chapter 57 of the revised statutes, and the sections here quoted are 1411, 1412, 1413, 1418, with part of section 1416.

1411. The town boards, village boards and common councils of

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every town, village and city, shall be boards of health, when not otherwise provided in city or village charters, and as such shall exercise all the powers and perform all the duties prescribed in this chapter, within the limits of the towns, villages and cities of which they are such officers.

1412. Every board of health may take such measures and make such rules and regulations as they may deem most effectual for the preservation of the public health, and for that purpose may appoint a physician, who shall be the health officer of the territory within the jurisdiction of the board, and who shall hold his office during their pleasure; they may also appoint so many persons to aid them in the execution of their powers and duties as they may think proper, and shall regulate the fees and charges of every person so employed by them; and they may examine into all nuisances, sources of filth and causes of sickness, and make such rules and regulations respecting the same as they may judge necessary for the public health and safety of the inhabitants.

1413. Notice shall be given by the board of health of all orders and regulations made by them, by publishing the same in some newspaper, if there be one published in such town, village or city; if there be none, then by posting up the same in five public places therein, and such publication of said orders and regulations shall be deemed a legal notice to all persons. * * *

1416. When any person coming from abroad, or residing in any town, shall be infected or shall lately have been infected with the Small Pox or other contagious disease dangerous to the public health, the proper board of health may immediately cause him to be removed to a separate house, if it can be done without danger to his health; and if such person cannot be removed without danger to his health, such board shall make provision for him in the house where he may be; and in such case they may cause the persons in the neighborhood to be removed, and may take such other measures as they may deem necessary for the safety of the inhabitants. * * *

1418. No person shall erect, maintain or keep any slaughter house upon the bank of any river, running stream or creek, or

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throw or deposit in such running stream any dead animal or any part thereof or any of the carcasses or offal therefrom into or upon the banks of any such river, stream or creek which shall flow through any city or village, or erect, maintain or use any building for a slaughter house within the limits of any village, incorporated or unincorporated, or any organized town containing two hundred or more inhabitants, or at any place within one eighth of a mile [1] of any dwelling house or building used as a place of business; and every person who shall violate any of the provisions of this section shall forfeit for each such violation not less than ten nor more than one hundred dollars; and the mayor of the city, president of the village and the chairman of the town in which any such slaughter house is located shall have power to, and shall cause the same to be immediately removed; and every such officer who shall knowingly permit any slaughter house to be used or maintained contrary to the provisions of this section shall forfeit not less than fifteen nor more than fifty dollars.

The parts omitted relate only to the methods of procedure in certain cases, and prescribe the liability to charges, but they in no wise modify or contract the extensive, almost absolute powers conferred, under which a board of health may do whatever seems needful to save a community from the invasion of contagious disease.

Were the local authorities properly sensible of their responsibilities, and did they organize themselves as health boards, exercise not the whole, but a very moderate proportion of their authority under the law as quoted above, there would soon be a marked and gratifying diminution in the total amount of sickness throughout the state.

HEALTH OFFICERS.

Of these officials, who are, or should be the executives of the local health boards, we have the appointment of 237 reported, an increase of only 30 over the number reported last year; it is greatly to be regretted that so few local boards have availed themselves of

[1] 660 feet.

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the power to appoint such officers, and it is a further matter for regret that o those who have been appointed by far the larger part are expected to give their time and services without any adequate compensation.

DISTRIBUTION OF DISEASE.

Of the six diseases which are included in our tables, five have visited forty localities, either simultaneously or at different times during the year; one hundred and three towns have suffered similarly from four of them, and one hundred and seventy-two places have been scourged by three; two hundred and two, and two hundred and three towns respectively, have seen two and one of the six disorders within their borders, leaving one hundred and seventy-five out of the whole number of towns reporting which make return that no one of the six has visited them during the year. Two places only report the visitation of the whole number.

Three hundred and sixty-four towns report an increased amount of sickness during the year, and three hundred and forty-eight make return that the amount has been below the usual average; ninety-six report it as being about the usual proportion. One hundred and twelve towns report that the death-rate for the year has been an average one, three hundred and fifty-five report that it has been larger than usual, and three hundred and twenty-six return a diminished rate of mortality.

Diphtheria alone has visited one hundred and sixteen towns; Scarlet Fever has been its most frequent companion, having been reported in connection with it from two hundred and forty-five localities. Typhoid Fever comes next in the order of frequency, having occurred in connection with Diphtheria in one hundred and eighty-nine places. Typhoid has appeared along with Scarlet Fever in one hundred and twenty-four townships, and has accompanied Diphtheria and Scarlet Fever both, in one hundred and five instances. The three diseases, Scarlet Fever, Measles and Whooping Cough, have been companions during the year in one hundred and eighty-eight places. Scarlet Fever alone has visited thirteen localities; Measles alone forty-one; and Whooping Cough unac-

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companied by any other disease has been reported from ten towns only in the whole state. Diphtheria has been by far the most frequent constituent of these evil combinations, Measles ranking second and Scarlet Fever third in frequency.

During the last session of the legislature an act was passed intended to prevent the

SPREADING OF CONTAGIOUS DISEASES,

by means of carelessness in preparing the bodies of persons dead from such maladies for transportation by railway or boat, or by carelessness on the part of those suffering themselves under infectious disorders, or having such sufferers in their care, in making use of vehicles intended for public convenience generally. It is well known that, in our larger cities, a hack is frequently used instead of a hearse to convey the body of a child to the cemetery, and a hack so used may easily become the unsuspected means by which Diphtheria, Scarlet Fever, or some kindred disease, is spread through many families.

As soon as practicable after the passage of the act, steps were taken to bring it to the notice of all who were interested in its provisions, especially to the notice of railroad, express and other transportation companies doing business in this state. A note, a copy of which is here given, was sent to the agents or executive officers of all such companies, and copies of the law, printed in legible type upon heavy paper, were furnished to all who desired them in numbers sufficient to place one copy or more in every railway station, freight or express office in Wisconsin. The following is a copy of the note above referred to:

WISCONSIN STATE BOARD OF HEALTH,
Office of the Secretary,
April 28, 1881.

DEAR SIR: — The State Board of Health desires to call your attention to the law — a copy of which is enclosed herewith — relating to the transportation of dead bodies, etc, so far as said law may affect you in the conduct of your business as common carrier. The board has had the law printed in the accompanying form, and will be glad to furnish you with as many copies as you may wish, for distribution on the line of your road and its branches, to

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station agents and other employees. It is especially desirable that one or more copies shall be posted in every railway station in Wisconsin for the information of the general public, and the board requests particularly that you will instruct your agents to that effect. On hearing from you in answer to this note, any needed number of copies of the law will be sent to your address.

Very respectfully yours,

J. T. REEVE, *Secretary.*

The text of the law is as follows:

CONTAGIOUS DISEASES.

The State Board of Health desires to call attention to the following important law, and requests all public health officers, physicians and agents of transportation companies to extend a knowledge of its provisions, and to aid in its enforcement.

Chapter 168.

AN ACT to prevent the spread of contagious, infectious, and pestilential diseases.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. Any person who shall bring, knowingly aid in bringing or cause to be brought, by railroad, steamboat, sailing vessel, stage coach or other public or private conveyance, into any town, village or city of the state of Wisconsin, the dead body of a deceased person, unless such dead body is accompanied by the written or printed certificate of a physician or coroner, clearly stating the cause of death, and unless, when the cause of death is Small Pox, Diphtheria, Scarlet Fever or other dangerous, contagious, infectious or pestilential disease, such dead body is also accompanied by the written or printed permit of a lawfully constituted public health authority and by the sworn declaration of an undertaker in writing, that the body of the person deceased as aforesaid is hermetically inclosed in an air tight metallic coffin or is encased with an abundance of powerful disinfectants according to the written or printed directions of said public health authority, so as to render the same entirely innocuous, shall be deemed guilty of a misdemeanor, and on conviction thereof, shall be punished by a fine of not less than fifty dollars, nor more than three hundred dollars, or by imprisonment in the county jail not less than twenty days, nor more than one hundred days.

SECTION 2. Agents and employees of incorporated transportation companies, and public or private carriers of whatsoever name or nature, shall not receive for transportation, nor transport, the dead body of any person, except on receipt of duly executed papers showing that the conditions required by

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section one of this act have been complied with, under the same penalties as therein provided.

SECTION 3. Any physician, or any person assuming to act as a physician, who shall issue a false certificate whereby a case of Small Pox, Diphtheria, Scarlet Fever or other dangerous, contagious, infectious or pestilential disease may be concealed, shall be deemed guilty of a misdemeanor, and shall, on conviction thereof, be punished by a fine of not less than fifty dollars, nor more than three hundred dollars, and by imprisonment in the county jail not less than twenty days, nor more than one hundred days; and the ignorance of an uneducated practitioner of medicine shall not be pleaded in justification or extenuation of his offense.

SECTION 4. Any person knowingly laboring under Small Pox, Diphtheria, Scarlet Fever, or other dangerous contagious, infectious or pestilential disease, who shall wilfully enter a public place or a public conveyance, or shall in any way wilfully subject others to danger of contracting his disease, or any person who shall knowingly and wilfully take, aid in taking, or cause to be taken, a child or other irresponsible person while laboring under any of the aforesaid diseases into a public place or public conveyance, or shall in any way knowingly and wilfully subject others to danger of contracting any of the aforesaid diseases from such child or irresponsible person, or any person who shall knowingly and wilfully subject others to danger of contracting any of the aforesaid diseases from the dead body of a person deceased thereof, or any person who shall in any way knowingly and wilfully expose, aid in exposing, or cause to be exposed, a child or other irresponsible person to danger of contracting any of the aforesaid diseases, shall be deemed guilty of a misdemeanor and shall be subject to the same penalties as are provided in section one of this act.

SECTION 5. Upon complaint made in writing, under oath, before any magistrate or justice of the peace charging the commission of an offense against the provisions of this act in his county, it shall be the duty of the district attorney to prosecute the offender.

SECTION 6. This act shall take effect from and after its passage and publication, and all acts and parts of acts conflicting with the provisions of this act, in so far as they contravene the same, are hereby repealed.

Approved March 23, 1881.

Published March 26, 1881.

Under the fourth section of this act it is probable that children from families or houses where contagious diseases prevail may be legally excluded from attendance on the public schools. Those who are indifferent or reckless enough to expose all the children in a given

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school district to the danger of contracting a dangerous infectious disease, by sending a child to school, it may be from the very bedside of a brother or sister suffering under such a disorder, may also be taught by this law that careless or selfish disregard of the health of others is a serious thing, and is so considered by the statute. The too common practice, complained of in a communication elsewhere quoted, of holding public funeral services in the event of death from contagious disease, at which the body is exposed to the view of all present, may also be prevented by the enforcement of the provisions of the same section.

Another measure, also due to the legislature of 1881, is the following act, which constitutes a practical prohibition from the practice of medicine or surgery of a dangerous class of self-styled, traveling doctors, who, by the assumption of titles and honors to which they have no right, impose upon the people, often to their great injury:

AN ACT to prevent quacks from deceiving the people by assuming a professional title.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. No person practising physic, or surgery, or both, who is prohibited by section one thousand four hundred and thirty-six of the Revised Statutes of Wisconsin, 1878, from testifying in a professional capacity as a physician or surgeon in any case, shall assume the title of doctor, physician, or surgeon, by means of any abbreviation, or by the use of any word or words, letters of the alphabet of the English or any other language, or any device of whatsoever kind, printed, written or painted, or exhibited in any advertisement, circular, hand-bill, letter, or other instrument, nor on any card, sign, door or place whatsoever. Any person violating any provision of this act shall be deemed guilty of a misdemeanor, and shall, on conviction thereof, be punished by a fine of not less than twenty-five dollars, nor more than one hundred dollars, or by imprisonment in the county jail, not less than ten days, nor more than sixty days, for each offense.

SECTION 2. Upon complaint made in writing, under oath, before any magistrate or justice of the peace, charging the commission of an offense against the provisions of this act in his county, it shall be the duty of the district attorney to prosecute the offender, and in all such prosecutions the burden of proof shall be upon the defendant to establish his right to use such title under the provisions of this act.

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SECTION 3. Any person prohibited by section one of this act from assuming the title of doctor, physician or surgeon, who shall practise, or pretend to practise, physic or surgery, or both, shall not be exempted from any, but shall be liable to all of the legal penalties and liabilites for malpractice; and ignorance shall be no excuse for failing to perform, or for negligently and unskilfully performing, or attempting to perform, any of the duties required by law of practising physicians or surgeons.

SECTION 4. Every person pretending to practise physic or surgery, or both, shall, upon demand of any person, exhibit all diplomas or licenses that he may have to practise physic or surgery, or both, and if such person upon demand shall refuse to exhibit such diplomas or licenses, any suit instigated against him under this chapter shall not be considered malicious.

SECTION 5. This act shall take effect from and after its passage and publication.

Approved March 30, 1881.

The section of the revised statutes referred to in the first section of the act above quoted is as follows:

SECTION 1436. No person practising physic or surgery, or both, shall have the right to collect in any action in any court, fees or compensation for the performance of any medical or surgical service, or to testify in a professional capacity as a physician or surgeon in any case, unless he shall have received a diploma from some incorporated medical society or college, or shall be a member of the state, or some county medical society legally organized in the state.

SPECIAL CORRESPONDENTS.

To the gentlemen in various parts of the state who have kindly assumed the relation of special correspondents to the board, our sincere thanks are due. By no other means is it possible to obtain from time to time the information of which we stand in need concerning the sanitary conditions prevailing in various districts, while, as regards material of general public interest and value, the extracts presented herewith and those published in preceding reports of the board speak for themselves, and make further testimony from us needless.

It is a matter for congratulation that the study of general sanitation and hygiene is now receiving very marked attention among the more intelligent portion of our people whatever their occupation in life; this fact is made evident by the increasing number of

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communications received in connection with the regular, formal reports from local boards, extracts from some of which form a feature of the two preceding reports, and which it is to be hoped will form a part, constantly increasing in interest and value, of reports yet to be issued. Very many of these notes give evidence of an amount of knowledge concerning sanitary matters and an appreciation of the work of the board that is gratifying in a high degree. To all who have thus favored us during the year we again tender hearty acknowledgments, and trust that their numbers will steadily increase. In the very important field of household hygiene it would seem that the women of Wisconsin should feel a deep interest, and we here repeat our desire that we may receive some communications from them on any sanitary subject in which they may be interested.

THE PRESS.

It is with great pleasure that the attention of the board is again called to the obligations under which it has been laid by the newspaper press throughout the state. In all cases where it has been prudent or necessary to call public attention to any danger threatening the health of our citizens the various newspapers of Wisconsin have, almost without exception, lent their powerful aid in giving a wide publicity to the warning or advice, thus enabling us to reach a larger number of the people than we could hope to reach or influence in any other way or through any other channel. It has been the practice of this office on the publication of any of its health circulars, to send the first copies issued to the newspapers, very many of which have reprinted the documents in full, while others have given copious extracts therefrom, and others still have made mention of the publication in some conspicuous portion of their columns; not a few indeed have combined the reprinting of circulars or abstracts of them with editorial notice thereof. The publicity obtained in this way has invariably created a large demand for the documents in question, and secured for them a wide circulation.

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Secretary's Report.

LIBRARY.

Since the date of my last report the library of the board has been increased by gifts to a very considerable extent. In addition to the usual number of volumes received from other boards, state and local, by way of exchange, the Medical Society of Wisconsin has transferred to the board a large collection of books and pamphlets embracing a considerable amount of material valuable for the purposes of this board. Besides this large accession the following volumes have been received as

GIFTS.

Report of the Board of Health of the State of California for 1879–80, from F. W. Hatch, M. D., secretary; Rocky Mountain Health Resorts, by C. Dennison, M. D., from the author; Thirty-eighth Annual Report of Registration of Births, Marriages and Deaths in Massachusetts, from the State Board of Health, Lunacy and Charity; Reports of the Commissioner of Agriculture, Washington, D. C., for 1874, 1878 and 1879, three volumes, from Hon. Angus Cameron, U. S. Senator; Third Annual Report of the Board of Health of the State of Connecticut, 1880, from C. W. Chamberlain, M. D., secretary; Annual Report of the Board of Health of the City of Reading, Penn., for 1880, from the health officer; Fifth Annual Report of the Board of Health of the City of Utica, N. Y., for 1879, from J. G. Hunt, M. D., health officer; Annual Report of the Board of Health of the City of Burlington, Vt., for 1880, from H. H. Atwater, M. D., health officer; First Annual Report of the Sanitary Reform Society of New York, from Jas. Gallatin, Esq., secretary; Third Annual Report of the Board of Health of the City of Augusta, Ga., from the board; Biennial Report of the Board of Health of the State of Delaware for 1879–80, from W. Marshall, M. D., secretary; Twenty-seventh Annual Report of Registration of Births, Marriages and Deaths in Rhode Island for 1879, from C. H. Fisher, M. D., secretary of State Board of Health; Second Annual Report of the Board of Health of the State of Illinois for 1879, from J. H. Rauch, M. D., secretary; Sanitary and Statistical Report of the Surgeon General, U. S. Navy, from Philip

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S. Wales, M. D., Surgeon General U. S. N.; Annual Reports of the Board of Health of the State of Colorado for 1879–80, from F. J. Bancroft, M. D., secretary; Report to the House of Representatives on the Adulteration of Foods, by G. T. Angell, Esq., from the author; First Biennial Report of the Board of Health of the State of North Carolina, from T. F. Wood, M. D., secretary; A Sermon on Public Health and Sanitary Reform, by Rev. Chas. Hawley, D. D., Auburn, N. Y., from the author; Annual Report of the Board of Health of the State of Louisiana, from Joseph Jones, M. D., president; Circular on the Restriction and Prevention of Small Pox, issued by the Board of Health of the State of Connecticut, from C. W. Chamberlain, M. D., secretary; Third Annual Report of the Board of Health of the City of Augusta, Ga.; By-laws and Rules of the Board of Health of the City of Augusta, Ga., from T. L. Blome, Esq., secretary; How We Fed the Baby, by Dr. C. E. Page, from the author; Tenth Annual Report of the State Board of Charities and Reform of Wisconsin, from Rev. A. O. Wright, secretary; Annual Report of the State Superintendent, Wisconsin, from Hon. W. C. Whitford, superintendent; Circular on the Restriction and Prevention of Small Pox, issued by the Board of Health of the State of Iowa, from L. F. Andrews, M. D., secretary; Annual Report of the Health Department of the District of Columbia for 1880, from S. Townshend, M. D., health officer; Fourteenth Annual Report of the Board of Health of the City of Dayton, Ohio, from T. S. Neal, M. D., health officer; Eighth Annual Report of the Board of Health of the City of New Haven, Conn., from C. A. Lindsley, M. D., health officer; Transactions of the Medical Society of the State of Vermont, from the secretary; Annual Reports of Registration of Births, Marriages and Deaths in Vermont for 1877–78, from the Secretary of State, Vermont; Third Annual Report of the Board of Health of the State of Rhode Island for 1880, from the board; Nosological Tables for the Registration of Deaths, issued by the State Board of Iowa, from the secretary; Reports of United States Consuls, Nos. 7 and 8; Report of the Committee for Investigating American Pork and the Presence of Trichina Spiralis Therein, from the secretary of state, Washington, D. C.; Repre-

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sentation of Women on Boards of Charity, etc., by Mrs. W. P. Lynde, from the author; Third Annual Report of the Board of Health of the State of Kentucky for 1881, from J. J. Speed, M. D., secretary; Transactions of the College of Physicians of Philadelphia, Penn., third series, vol. V, from the college; Annual Report of the Board of Health of the City of Richmond, Va., for 1880, from J. G. Cabell, M. D., president; First Report of the Board of Health of the State of Tennessee for 1879-80, from W. M. Clark, M. D., secretary; Transactions of the Medical Society of the State of Alabama for 1881, from T. A. Means, M. D., secretary; First Annual Report of the Board of Health of the State of New York, with circulars, from E. Harris, M. D., secretary; Proceedings at the Anniversary Meeting of the West Ewing Improvement Association, 1880; Transactions of the American Society of Civil Engineers; The Sewerage of Memphis, The Sewerage and Drainage of Cities, and Stormwater in Town Sewerage, by Geo. E. Waring; Anlagen von Hausentwaesserenungen, from W. P. Gerhard, C. E., Newport, R. I.; Health Hints for the Care of Children During the Hot Season, from the Philadelphia (Penn.) Society for Organizing Charity; Reports of the Commissioner of Education for 1878-79, from Hon. John Eaton, commissioner, Washington, D. C.; Medical Communications of the Medical Society of the State of Massachusetts, 1879-80, from D. H. Hayden, M. D., librarian; Report of the Board of Health and Vital Statistics of the County of Hudson, N. J., for 1880, from the board; Eighth Annual Report of the Board of Health of the State of Michigan, from H. B. Baker, M. D., secretary; Second Annual Report of the Board of Health, Lunacy and Charity, of the State of Massachusetts, Public Health Supplement, 1880, from the board; Thirty-ninth Annual Report of Registration of Births, Marriages and Deaths in Massachusetts, from the State Board of Health, Lunacy and Charity; Temperature of Fresh Water Lakes and Ponds, by Prof. Wm. Ripley Nichols, Massachusetts Institute of Technology, from the author; Transactions of the Medical Society of the State of New Hampshire for 1881, from G. P. Conn, M. D., secretary; Second Annual Report of the Board of Health of the State of South Carolina, from H. D.

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Frazer, M. D., secretary; Fifth Annual Report of the Officers of the City of Aurora, Ill., from M. M. Robbins, M. D.; Blue Book for 1881.

Purchases — Frankland's Water Analysis; Balfour's Water Supply; Lincoln's School and Industrial Hygiene; Carter's Eyesight, Good and Bad; Proceedings American Public Health Association, vol. 5; Beale's Slight Ailments; Dunglison's School Physiology; Bucknill's Care of the Insane; Jacobi's Diphtheria; Beard's Nervous Exhaustion; Fothergill's Food for Invalids; U. S. Postal Guide; Jeffries' Color Blindness; Burdett's Cottage Hospitals; Corfield's Health; Bulkley's Skin in Health and Disease.

EXPENSES.

The expenditures made during the year with your approval and direction are embraced under the following heads, and the vouchers therefor are numbered from 299 to 349, inclusive:

Official expenses of members	$301 65
Postage (including telegraphing) and box rent	500 00
Printing and binding	520 99
Books and instruments	158 09
Secretary	1,800 00
Clerical services	300 00
Furniture	65 00
Transportation (express charges, etc.)	19 70
Stationery	5 69
Miscellaneous	6 10
Total	$3,677 13

Among the instruments included in the above statement are a barometer and a set of standard thermometers from the office of the U. S. Signal Service, Washington, D. C.

The correspondence of the board during the year has been extensive, embracing, in addition to the work already referred to, a large number of letters concerning the sanitary condition of different localities; sanitary advice on subjects concerning which such advice has been asked or seemed necessary; and many other communications having more or less direct connection with the

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work of the board. Besides this, sundry specimens of water, suspected of having been the cause of disease, have been examined. In one of these cases the services of Prof. Daniells were called into requisition to analyze a sample of water submitted by Dr. O'Brien, of Waupun, and taken from a well on premises where an obscure form of fatal disease had led to the suspicion that some local cause of sickness existed. Prof. Daniells reported, however, that "the examination showed it to be in all respects wholesome."

Throughout the year, as during the preceding one, I have had the assistance of Prof. T. W. Chittenden, who has rendered efficient service in the discharge of the widely varied duties of the office.

Respectfully,

J. T. REEVE, M. D.,
Secretary.

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HINTS ON HYGIENIC EDUCATION.

BY MRS. WM. P. LYNDE, OF MILWAUKEE.

"The existing relation of the doctor to society is an absurdity. We but half use his skill when we employ him merely to cure the sick and heal the wounded. He should be *much more* employed in teaching the public the avoidance of disease and healthful modes of living. Every church in the country should be opened at least once a week for such instruction. There could be no more appropriate use for churches dedicated to Him who healed all manner of disease among the people."[1]

If any should hesitate about the propriety of opening our churches for the purpose of teaching this *Gospel of Health*, it would surely seem that none can question the wisdom of a State Board of Health in devoting much of its time, or opening the pages of its reports, to the discussion of subjects so important to the welfare of the people, or can doubt that in so doing it would perform an important duty and fulfil one of the purposes of its creation.

One of the most practical and wise physicians I have ever known was accustomed to enter in his day-book charges to A. B. for "advice and medicine," or to C. D., "visit, advice and medicine;" long after he had left the scene of his earlier practice, a sensible, intelligent farmer, whose family physician he had been, told me that, in making a final settlement of accounts with the doctor, he saw these entries and said: "So, doctor, you charge for advice, do you? A man can generally get all the advice he wants for nothing." The doctor answered: "I think, John, you will find that my advice has been worth paying for." And said the farmer, "So I have found it, to my great sorrow; it was worth all the medicine he ever gave, and for the want of it I have lost all my children but this one," laying his

[1] Philadelphia American, August 10, 1881.

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hand lovingly on the head of a fair young girl at his side; "I can see now 'twas the wise advice that saved them to me while I had him to give it; 'twasn't the medicine, for they had enough of that."

The importance of a knowledge of the principles and laws of nature in their application to the preservation of health and the prevention of disease, and the development of sound, healthful bodies capable of a proper performance of the requirements of ordinary life, both physical and mental, seems worthy the consideration of all who aspire to be leaders or teachers in this department of public thought, and especially for women, with whom rests the present and future well-being of the race.

In an able and interesting paper read before the Association for the Advancement of Women in Boston by Mrs. C. L. Colby, of Nebraska, a graduate of the University of Wisconsin, "Concerning Farmers' Wives," occurs the following: "Ignorant of hygiene, they (the farmers' wives) allow their families to breathe impure air at night, to neglect personal cleanliness, to consume the most indigestible kinds of food. Ignorant of domestic economy, they perform many of their duties in the most arduous and unsatisfactory ways. Ignorant of their own physical structure, farmers' wives allow themselves too little time for recovery from their frequent child-births, and in various ways violate the laws of nature. Nor is the body alone defrauded by their lack of knowledge; unconsciously they ignore their spiritual relationships, and lose the sweet attractiveness of home life which despite every want might still be theirs if they knew how to secure it." She asks, "Are there any remedies for these ills which sadden so many lives in so many homes in our land?" and answers, yes, "by education of a practical kind and as an economic measure of the highest importance," and adds: "There should be colleges of domestic economy for girls, where the proper preparation of food, care of the health and dwelling, and household thrift should be taught." Without waiting for the establishment of new colleges, would it not be well to consider whether in the broad course of study pursued in our schools, public and private, there might not be found some place for these things which seem of the very highest importance — for

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a course of hygiene and instruction in the principles and laws of physical life, of foods, their character and preparation?

The young students of natural science learn the height, density and chemical constituents of the atmosphere; let them be taught also the necessity of a pure atmosphere to healthful breathing and the dangers of an impure one, and the importance of good ventilation and how to accomplish it. In learning of gases let them be taught to fear the consequences of inhaling the deadly ones that rise from the sewers in towns, or the sinks, or slop-holes, or filthy sties, or barn yards that too often encircle country houses. When the young pupils have learned these things, and that breathing such air or that of a closed, ill-ventilated room all night will cause the dull, heavy head which makes it "so hard to study," and them to stand so low in the grade, they will have made an advance in practical knowledge too rarely acquired under systems of theoretic instruction, and having a value far above the mere acquisition of learning. In botany they are taught of genus and species, calyx and petal, stamen and pistil, bulb and tuber; could not the quality, character of food-plants, powers of nutrition, economic values and uses, methods of preservation and preparation, be included? In physiology the scholar learns of bone and tissue, and organs of digestion and circulation and other of the processes and functions of life. Cannot the young girl who has worn thin shoes, and sat with damp feet and burning face and aching head, and missed in all her lessons, be taught that the disturbed circulation consequent upon the damp feet has caused all this mortification and suffering, and possibly endangered health and life; or the boy who beside an open window or door has "cooled off" after a run or a game be taught that he has checked the perspiration by which nature was cooling his heated body in accordance with her own processes and in a manner that involved no hazard of colds or other danger to health?

Can we teach the teacher and the mother that an over-worked, wearied little brain cannot be over-stimulated with impunity? That a burdened, oppressed young head can receive no more, goad it as you will, and that the limit of endurance for the tortured little body is reached with danger?

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Hints on Hygienic Education.

If in learning of the circulation of the blood and the vessels that serve for it they were taught that when a spurting irregular flow follows a cut it indicates a severed artery, and that with a strip of cloth torn from a handkerchief or the clothing and a bit of stick, a tourniquet may be improvised that will check the flow until the doctor comes, lives might be save that would otherwise be lost through ignorance of so simple measures. In these same lessons the future young mother might learn that the uneasy little head that will always turn to the one same side, move it as she may, shows a disordered brain, a disturbed circulation that is likely to result in paralysis, imbecility or death, and that the skill of the physician is needed before it is too late. In chemistry and physics a knowledge of the processes of evaporation and fermentation as applied to domestic uses, of the powers of neutralization of acid and alkali, may in after life prove of incalculable value. An illustration of this is shown in the case of a young girl who died of starvation from a slow closing of the organs of the throat in consequence of having drank pearl-ash water, mistaking it for cider; her parents being ignorant of the danger no remedies were used in season, and this dreadful result followed. In the same community shortly after this sad occurrence a man went in hot haste for the doctor to attend a boy who had drank strong lye; the doctor, putting lemons into the pockets of the messenger, said, "Run your horse back and give strong lemonade to the boy until I get there." The acid neutralized the alkali and no harm ensued. The distressed friends were taught a lesson of applied chemistry that one of them afterward utilized to the immense relief of a child in the arms of a frightened mother whom he met rushing unbonnetted through the streets to find a doctor, the child having drank spirits of ammonia; the acid was again employed, and again in accordance with the unvarying processes of nature, the neutralization of acid and alkali occurred and no serious consequences followed.

If the doctor can teach the workingman the danger of a violation or infraction of the laws of his being, or show him the way in which such violation may be brought about, as for example that by taking large draughts of ice-cold water into his stomach he so

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lowers the temperature of that important organ as to render it for the time unable to perform its functions properly, or that by the over stimulus of liquors he may permanently impair the whole digestive apparatus, a much more important service will have been rendered than the cure of a paroxysm of colic or a gastric fever, the consequence of such violation of the laws of health.

May not art studies be as wisely directed toward the development of perfect human bodies as to the æsthetic cult of classical models, and the perception of grace and beauty be developed as highly in learning to stand on both feet without distorting the limbs, or to walk with ease and in such a manner to avoid unnecessary fatigue, or to sit naturally and so as not to induce curvature of the spine and displacement of the vital organs, or to entail on young lives years of suffering and perhaps unsightly deformity? Lessons like these and many others on the simple laws and principles of natural life might be introduced and learned along with lessons in natural science, or in place of some other less practical ones, and so learned as to become a part of the habits and practices of life. This might be done if we could but set our leaders, the teachers and doctors and preachers to thinking, and valuing such lessons at their real true worth; if the true purposes of education were considered to be a fitting for the conditions and duties of life instead of the mere acquisition of knowledge — a training for the work of life, instead of a stuffing the mind with learning.

May not a State Board of Health suggest to a State Board of Education that it might be as profitable to the children — the embryo men and women of the state, to establish a department for the study of the laws of health and living as one for the study of agriculture, or military tactics, or political economy? Would not stalwart bodies in men and sound, healthful ones in women render the pursuits of agriculture, and commerce, and public service more successful, and increase the probabilities of an enduring body politic? The study of the physical laws which control and maintain life might prove as good mental discipline, and give as useful information, as the study of the courses of rivers or the boundaries of states. The man or the woman, should it become needful to

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know the source or course of a river or the boundaries of a state, can easily obtain the knowledge, but the consequences of a violation of some of the laws of physical life, as impaired digestion, imperfect or unequal circulation, or deformed limbs or spine, are beyond his powers of remedy when, too late, he laments his ignorance.

The building of lives, which is every mother's work, is the one branch almost never taught in either houses or schools, and so the lives are too often badly builded, badly lived and sadly ended, conceived in sin and born in iniquity, the Sacred Scriptures teach, and science is every day demonstrating the truth of the inspired utterance. Heredity with its fearfully inexorable laws is staring us in the face on every side, and yet we go on, blind to consequences, and deaf to remonstrances, and permit disease and vice to propagate themselves and think we are too pure or too modest to see facts, too prudent to teach the great grand truths of nature and life to our children.

Theories, abstractions, ologies and isms have their mission and fill their places in the world of knowledge, but the laws of God in nature and in man interpreted by science are immutable and everlasting, and to learn of them, rightly to comprehend them in their relation to ourselves, our conditions and our duties, is to learn of the highest and best, and of that which will tend to benefit and elevate the race.

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HYGIENE CLUBS FOR WOMEN.

BY DR. HELEN M. BINGHAM, OF MILWAUKEE.

One of the educators of the present day is the club. With the lengthening evenings of autumn comes, in nearly every village, the annual gathering together of some club; and, whether it be a Plato club or a farmers' club, or something quite different from either, it becomes the center of a great deal of thought and talk, while the interests it represents at once assume a new importance in the estimation of the community. The stimulating and encouraging effect of the club on its members is very great. Calling once on a lady noted among her acquaintances for the fidelity and exactness with which she discharged the minutest duties of a housekeeper, I found her sitting by the kitchen stove watching a roast in the oven, paring apples for pies and superintending a washing done by a young girl in the same room. As the house was full of company, there was nothing strange in all this; but I was surprised to see that the housekeeper and hostess had in a chair beside her a history of England from which she studied while she worked. She was led to study under these distracting circumstances by her membership in a History club. Without the club she could not have found time to study. With it she found plenty of time, and in many ways was greatly benefited by her study. Hundreds of other women have had similar experience of the assistance which a good club gives to all the members.

There are few subjects upon which the popular knowledge is as deficient as it is in regard to hygiene. Everybody has his own notions on the subject, and is likely to express them with great force and freedom, denouncing as "unhealthy" whatever he finds it unprofitable for himself to be, to do, or to suffer. A man may conceal his dissent from his neighbors' views of agriculture and art, but let his neighbors eat of a dish which makes him ill, wear flannels more or less than he believes proper, or pursue with some

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Hygiene Clubs for Women.

eagerness a favorite phantom which it tires him to chase, and, if he is a mortal of the ordinary kind, his tongue is loosened, he is called to preach. Notwithstanding all these exhortations, however, there is such a lack of exact knowledge of the means by which health may be preserved that no subject is more worthy of club study than hygiene, and the importance of the science is great enough to give it a club in every village. The object of this paper is to urge the formation of hygiene clubs for women.

The public schools ought to give every American citizen an elementary knowledge of hygiene, but practically it cannot be claimed that the hygiene learned at school is of any value. A work on "Anatomy, Physiology and Hygiene" is studied, but more than half the labor put on this book is given to the anatomical part. How much knowledge of trigonometry would we expect in a class of beginners working one or two terms on a book marked "Arithmetic, Geometry and Trigonometry?" Other branches — music, drawing, mathematics, languages, history, even physiology and zoology — are often taught by those who have an enthusiasm for them, but an enthusiastic teacher of hygiene is almost an unknown personage. Many of those who try to teach hygiene are in a position much like that of a blind man who tries to describe the lights and shadows of a landscape he has never seen. The result is that while the close of every school year sends out zealous devotees of the muses and of many sciences, the only young people found doing reverence to the friendly goddess Hygeia are those preparing for a rowing match or a bicycle race.

But even if the schools accomplished what ought to be required of them, there would still be need of much post-graduate study of hygiene; for hygiene is not made up of a few great principles that every one can grasp, but of all the numberless details of life, and these details cannot be mastered in the few short years of a course of study in the public schools. As the schools accomplish hardly anything in this direction at present, the need of study by adults is even more imperative now than it is likely to be in the future.

But why should women be especially urged to enter upon this study? Because the natural guardians of health in the family are

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women. Without their intelligent co-operation hygienic living is impossible. They thwart the best laid plans if they do not understand them. In a house with every convenience for ventilation a well-disposed woman may keep bad air. With plenty of everything at her disposal she may systematically urge upon her family food, work and amusement the most injurious for them, while at the same time she withholds or neglects to provide the things most needed; and into her woman's kingdom her husband, though he be rich in hygienic lore, cannot often bring the ability to right the wrongs he more or less clearly perceives. As the mother is, the home is. Right living, if it ever comes, will come because women have learned to appreciate the nature and value of all hygienic influences. They can do this only by careful study.

The need of a study of hygiene by women would not be so great were not mothers impelled by instinct to attempt a very watchful guardianship over the health of their children. This instinct is so strong that it is unsafe to leave it without the restraining influence of education. For often it happens that, for want of a little instruction, a mother in her anxiety to do something useful does that which results in lasting injury to those she would die to save from harm. The modern ideas about children make it more important now than it ever was before for mothers to be well versed in hygiene. Formerly a large proportion of the time parents gave to their children was spent in teaching them the duties of filial love, obedience and respect. Modern parents spend the time in trying to promote the interests of their children, and, so earnestly do they try, that in some families children are under the constant supervision of some watchful eye. Their play as well as their work is planned and directed by others. They hardly move without superintendence. With wise mothers all goes well, but when good intentions and great zeal fail to be supplemented by knowledge, all this care may result in very great injury. It is just as possible to kill a child by too much care as by too little. Under ordinary circumstances a healthy child, if left to follow the promptings of his own nature, stands a very good chance of getting, simply because he chooses to take them, the air, food and exercise necessary to his

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physical development; and if he lives among educated Christian people he will, without any instruction from anybody, make some progress mentally and morally. His development, though less rapid and probably less symmetrical than it would have been had he received proper attention, is continuous and healthy. But this healthy development may be rendered abnormal or may be entirely arrested by his mother's learning some one fact and attempting to obey its teachings, without knowing anything of the other facts which should modify those teachings. The simple fact that oatmeal is good for children, that children have been killed by the efforts to "harden" them, and that they ought to receive moral instruction, may any of them be sufficient, when made use of by a devoted and persistent mother, to overthrow the health of all the children in a family. If a mother has made up her mind to provide her child with all that is good, and to shield him from everything harmful, it is her first duty to inform herself by careful and thorough study as to the nature of all the influences she has been led by hearsay evidence to classify as good and bad, and because mothers will in one way or another sacrifice their time, health and strength to their children, society should try to so educate its mothers as to make the sacrifice redound to its own good.

Women should study hygiene to obviate what they deem the necessity of giving their children medicine for trifling indispositions. Granting that frequent dosing, now because a child is supposed to have worms and now because its blood is supposed to be bad, may possibly do some good (and it is something to admit that the ability to diagnose and cure disease can be learned from one or two domestic "doctor books"), it would certainly be better to avoid, by a proper observance of hygienic laws, both the illness and the medicine; and there is no doubt that a very large proportion of all cases of illness might be avoided in this way.

The thoroughness with which women should study hygiene is something which every woman should consider before beginning the study. Ought they to regard a thorough knowledge of hygiene as an indispensable preparation for the work of a mother and a home-keeper? Or is it sufficient for them to learn hygienic laws

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without seeking to learn the reason for those laws? Some teachers of hygiene think that the latter is all that is desirable; but why should the preparation of woman's greatest work be so meagre? Is it right for intelligent mothers to run this risk of putting themselves in the position of an industrious beaver, which when shut up in a dry yard tried to go on with its old work of building dams? Women must be able to see how and why the requirements of hygiene are modified by circumstances. For a mother to know what food is called for by the health, age and occupation of each one of her family, for her to adapt the clothing, bathing, exercise and study of each child to his needs and capacity, she must know many of the reasons for what are called the laws of life.

Dogmatic statements of hygienic truths are always objectionable because liable to be successfully disputed by the first gossip who happens to speak of them. They are controverted by experience, too. Tell a robust woman in the most positive manner that every one needs a certain number of cubic feet of pure air in his sleeping room, and she — remembering that she has slept for years in a small room shut up like a box — goes off thinking of the superiority of her experience to your theory; but explain to her the part played by oxygen in the system, and she will wonder she is still alive. Just here is a weak point in the teachings of the schools, which it is desirable to avoid. Too little is said about the conservative power of nature. Hygienic laws are taught too much as the laws of the Medes and Persians might be taught. Allusion is rarely made to the fact that some of those whose mode of life seems most unfavorable to health appear to be perfectly well. Nature's power of making an organ that is well do for a long period of time the work of one that is diseased, her power of making countless adaptations to circumstances, is a subject that is full of interest when regarded simply as a matter of curiosity; but it is also worthy of study because it explains why the violation of hygienic laws is not always followed by evident punishment, and because it tends to prevent anxious forebodings over the supposed possible consequences of every over-exertion or exposure. Exact knowledge gives a sense of security, while half-knowledge always magnifies

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Hygiene Clubs for Women.

the evil it can neither understand nor prevent. The education to be aimed at is one that will prevent both disease and the fear of disease. We should aim at the same thoroughness in the study of hygiene as is aimed at in the study of language. To be continually looking up rules in a grammar is proof positive that one cannot write good English. It is universally admitted that to write well one must obey the rules of grammar unconsciously. It is equally true that we shall never live hygienically while we talk so much about it. To live well one must obey the laws of hygiene unconsciously, and he cannot do this until he has fully comprehended the reasons for these laws.

Most of the objections to the study of hygiene by women come from themselves; they are based on wrong ideas of duty to children, and resolve themselves into these two: no strength and no time. It is true that nine mothers out of ten are debilitated and exhausted by their work. On this account, if on no other, a little study might be prescribed for them. Exercise is as necessary to the health of the mind as to that of the body, and mind and body are so closely related that mental exercise is also necessary to physical well-being. A frequent cause of debility in women is the lack of something to raise their thoughts above their every-day cares. Many a busy, anxious, overworked mother might accomplish much more if she forced herself to drop her work for brief but frequent intervals of study.

The validity of the objection no time, depends on the comparative value of what is done now, and what might be done as the result of study. How much a thorough knowledge of hygiene must do towards putting each one into possession of all the powers nature meant him to have, how much it must add to the spiritual beauty of life, it is impossible to calculate; but we get a glimpse of the time and labor saved by it when we think of the difference between a man who first tries to understand the necessity and means of ventilation when he is made one of a committee to build a school house, and another member of the committee whose mother taught him in his boyhood, as his curiosity asked for the information, how she ventilated his home. We can see that in preventing

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near-sightedness and round shoulders in school, a teacher whose mother taught her when a little girl how to avoid these evils must have a great advantage in case of instruction and probability of success over a teacher who has just gained her first ideas in this direction at a teachers' institute. In all the walks of life a knowledge of hygiene would save much time now lost by sickness, and would make work easier and life happier. The possibility of being able to give children habits and knowledge so useful to them is something too precious for mothers to neglect. Certainly it justifies the expenditure of some time every week, even though this involve the necessity of giving a little less time to the sewing machine, and clothing children in plainer garments.

A necessary preparation for every undertaking is to become acquainted with the scope and bearing of that undertaking. Every mother who has made up her mind why and to what extent she ought to study hygiene, is able to devise for herself a plan of study, and yet a few suggestions as to the method of study may not come amiss here. Hygiene clubs may be conducted just as the ordinary literary club is conducted. A president to preside at the meetings, and an executive committee of three to assign the work to be done, are officers enough. If there are only four in the club, one member can hold two offices. As a rule, the benefit to individual members is greatest when the club is small, not numbering more than ten members at the most. A very frequent cause of failure in women's clubs is the attempt to do too much. Company and Croup interfere, and if as much work is planned as can be done under the most favorable circumstances, one member after another falls behind, becomes discouraged, and finally drops out of the club. The committee should give each one a month's notice of the part she is expected to take. For each meeting exercises should be assigned to two or more members, who will do best to write and read their views on the subjects allotted to them. Each paper should be followed by a general discussion of its subject, each member of the club having prepared for this discussion by previous study. The first work of the club might be something like this:

January 3. First paper: Processes of Digestion Described.

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Hygiene Clubs for Women.

Second paper: The Uses of Food.

Explain the causes of hunger and thirst, and the offices of food in promoting growth, repairing waste and producing heat and force.

January 10. First paper: When to Eat; Two Meals or Three Meals a Day? Frequency with which food should be taken considered with reference to infancy, childhood, old age, sickness, hard labor, etc. Time of meals in relation to exhausting exercise and exposure to malaria or the air of sick-rooms. Regularity of meals. Sunday meals.

Second paper: How to Promote Digestion. As outside influences are most likely to affect digestion early in the process this paper must explain particularly the influence of the arrangements of the table, the conversation suitable for the table, and the effect of hurried meals.

January 17. Subject: What to Eat. First paper: Nitrogenized Alimentary Principles, their Sources, Mission and Value.

Second paper: Positive and Comparative Value of Animal and Vegetable Foods.

Third paper: Hygienic Cookery of Meats and Vegetables.

January 24. Subject: Non-Nitrogenized Alimentary Principles.

First paper: Fat; Its Sources and Uses.

Second paper: Sugar and Starch. This paper should have especial reference to children, explaining the natural craving of children for sweets, and the appearance and health of babies fed on starchy food.

Third paper: Inorganic Alimentary Principles.

January 31. First paper: Importance of Variety in Diet.

Second paper: How Much Should we Eat?

Third paper: The Causes of Indigestion.

February 7. If possible to induce one of the physicians of the village to address the club, it would be profitable to spend this hour in listening to what he may have to say on the Hygiene of the Digestive Organs.

The hygiene of the circulatory, respiratory, muscular and nervous systems would properly follow next, and with these the sub-

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jects of absorption, secretion, excretion and animal heat would naturally receive attention.

In studying hygiene women are likely to want to give special attention to their own and their children's health; but hygiene should be first studied as it applies to all human beings, and then it may be studied in its application to differences of rank, age and sex. If school girls and young ladies gave more attention to hygiene in the widest sense of the word, there would be less occasion for attention to the health of women, because two of the main causes of poor health in women would be removed. Unhygienic living and the nervous strains which result from the assumption of grave responsibilities without previous preparation kill many men, but neither of these causes of disease is so common, or is carried to so great an extent with men as with women.

The first great benefit to be expected from a hygiene club is not the knowledge gained by its members, but a belief in the value of physical perfection and the possibility of approximating toward it. Even of the women who might be induced to join a hygiene club, a great many do not expect ever to be well, or, aside from taking medicine, to make any particular effort to be well. They are quite resigned to not being well. Health appears to them to be a kind of *ignis fatuus* vainly pursued by crazy reformers who cannot begin the chase until they have learned to sing the praises of ugly dresses and unpalatable food. The thing most needed to raise the standard of women's health is a desire on the part of women to be healthy. The books of a hygiene club need not be many if they are well selected, and any member of the Board of Health would undoubtedly be willing to give advice in regard to the works best adapted to the needs of any particular club.

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COLOR BLINDNESS.

BY EDWIN W. BARTLETT, M. D., OF MILWAUKEE.

It is plainly the duty of every people to enact such regulations as shall prevent accidents from happening, by which lives may be lost and property wasted. In order to secure just consideration of such matters, it is usually only necessary to inform the people of the risk, its nature, quantity and prevention to secure proper action for its removal.

A large number of accidents are happening each year on railroads and vessels, some with such fearful loss of life and property as to be truly appalling, and if any method can be adopted by which they can be lessened it will surely be welcomed by all.

In order to prevent accidents on railroads and vessels two different colors are used as signals, red and green; red indicating danger while green indicates safety. In the day-time colored flags or solid surfaces are used, and at night colored lamps. These two colors are used for this purpose all the world over, and they are so easy to obtain, and can be so well seen by the normal eye, that it would be impossible to change these signal colors to any other color, shape or device which could be seen by all. In this age, when almost every one travels more or less, it is not very necessary to argue much to convince the people that a pilot should be able to distinguish these two colors and see where danger and safety exist, or that a locomotive engineer should be able to distinguish the color of a signal ahead, which if he fails to do, may mark the place where he and many of his passengers were ushered into eternity, or that any person not able to distinguish these colors should not be allowed to act as a pilot or engineer. There are many persons not able to do this, and it is the purpose of this paper to explain briefly the nature and frequency of this defect.

Over one hundred years ago it was discovered and recorded that

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there were persons who could not distinguish certain colors. The first case described accurately is that of John Dalton, a celebrated English chemist, who studied this defect in himself and published an accurate and detailed description of his own case in 1794.

His description was widely read and attracted general notice, and the defect was named after him Daltonism. Dalton was much amused at his defect and seemed to enjoy the amusement he afforded others by his mistakes in colors. He published a number of cases similar to his own.

Since Dalton's time a host of other cases have been published by different authors, but they have been usually considered as curiosities without much practical importance.

In 1837, Seebeck in Berlin examined a large number of students to find how many were color blind, and made an advance in that he found there was more than one kind of color blindness, and also that some were very color blind, while others were only slightly so.

About 1850, Helmholtz resuscitated and popularized the theory of Young in regard to color perception, and made color blindness much easier to comprehend, as it gives us a sufficiently clear conception of how the color blind see.

After this more cases were reported, pamphlets written and theories and suggestions advanced, but still little good came of it in studying the practical side of the subject to determine whether serious accidents had occurred in consequence of color blindness.

On November 15, 1875, a railroad accident occurred at Lagulunda, in Sweden, which intensely excited public attention, and at a trial which followed, testimony was adduced which led people to suppose that color blindness was one of the principal causes of the disaster.

This impressed Prof. Holmgren, professor of Physiology at the University of Upsal, with the idea that official scrutiny and control should be exercised over the sense of color among railroad employees, and he took the initiative in urging railroad companies and others to examine their employees, introduced a practical method which rendered the discovery of the color blind rapid and

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certain without incurring heavy expense or requiring extensive preparations, and which takes but a few moments to use. Holmgren gained permission first to examine a regiment of infantry, and found his method to be a success, the time for one examination being about one minute. In 2,220 men he found 2.7 per cent. color blind. In July, 1876, he reported his method and results to a congress of Scandinavian physicians, who unanimously resolved that it was necessary to examine and detect color blindness in railroad employees, in pilots and sailors and in schools. Thanks to the press this method and its results soon became known to the public, and railway officials were glad to have the examinations made.

At the first examination of railroad employees in company with railway officials, 266 persons were examined. Thirteen men, or 4.8 per cent., were found color blind; one of these was an engineer, one journeyman engineer, two conductors, one station master, one foreman, two overseers, one porter and four workmen.

This examination proved that there really were color blind in every grade of service of a railway, and this without there having been the slightest suspicion of it. Other railroads then took up the matter, and in a short time all their men were examined, the color blind discovered and taken from positions requiring perfect color sense.

In 1877 Prof. Holmgren published a book in Swedish on color blindness, the most important contribution that had thus far been made on this subject.

The same year the Smithsonian Institution published a translation of a part of this work.

In 1878 B. Joy Jeffries, M. D., a Boston physician, began to popularize color blindness in the United States, and in 1879 published "Color Blindness, its Dangers and Detection," giving a plain, practical idea of the whole subject. To him the American public are very much indebted for his enthusiasm, learning and humanity.

The danger from color blindness must be in proportion to the number of color blind.

Physicians interested in this subject in Europe and the United States have reported the result of over 50,000 examinations, and

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though their results vary from two to six per cent. of color blind, probably on account of the different methods used in examination, the average is about four per cent., or one in every twenty-five persons.

These cases were all males, and included railroad employees of all sorts, teachers, students, school boys, sailors, soldiers, mill-hands, prisoners, etc. Nationality or color does not make much difference with the average number.

A large number of females have also been examined and the reports vary more than of males, but we may infer from about 20,000 cases reported, not more than forty cases of color blindness, or one case in every five hundred females.

It is supposed that the greater exercise by women of the color sense develops this faculty to a greater degree in them and accounts for its more certain transmission to their sex.

Young's theory of color perception, as presented by Helmholtz, is that there are three principal or base colors, namely, red, green and violet, and that the other colors are but mixtures of some of these; that there are in the retina of the eye three kinds of nerve elements, whose faculty it is to distinguish colors; the stimulation of the first kind produces the sensation of red, of the second that of green, and of the third the sensation of violet.

Stimulation of all the color elements at a time gives the sensation of white.

Light is given out or reflected from objects in the form of waves, the waves having different lengths according to the color of the object from which they emanate. Light from red objects has waves of the greatest wave length of these colors; from green, waves of medium wave length, and light from violet objects, waves of the shortest wave length.

The waves of light from simple red objects enter the eye and stimulate the red perceptive elements and produce the sensation of red; those from green, for the same reason, produce the sensation of green, and those from violet produce the sensation of violet.

Yellow is a mixture of red and green; light from yellow objects has waves of different lengths — some as long as those from red ob-

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jects, and others the length of those from green objects, the proportion varying according to the shade of yellow.

These entering the eye stimulate both the red and green perceiving nerve elements and produce the sensation of yellow.

Blue is a mixture of green and violet, and the waves from it stimulate the green and violet perceiving elements and produce the sensation of blue. Purple, a mixture of red and violet, by its waves of different length, stimulate the red and violet perceiving elements and produces the sensation of purple.

There are other theories of color perception, but this seems to give the plainest idea of it, and its correctness is supported by the testimony of the color blind.

There are two classes of color blindness, total and typical.

A total color blind only distinguishes the difference between darkness and light and the different degrees of intensity of the light. All pictures are to them in black and white like photographs.

This form of color blindness is sometimes congenital, perhaps from a want of development, and sometimes the consequence of hereditary constitutional disease. It may be acquired by great abuse of the eyes, and also by the excessive use of tobacco and alcohol. Excessive smokers and drinkers among railroad men and sailors may become color blind at any time, while their sight remains good enough to hold their places.

It occurs very often after injuries to the head and with diseases of the optic nerve, and sometimes after severe diseases like typhoid fever. The cases caused by disease or injury may afterwards recover their color sense.

Fortunately the cases of total color blindness are not frequent. A typical color blind is one who cannot distinguish one of the fundamental colors above mentioned; there are therefore three classes of them, namely, red blind, green blind and violet blind. By some these are called partial color blind, a term that is liable to mislead.

All the members of a certain class do not see exactly alike, but near enough to be classed without much difficulty. A person may be also only partially or slightly blind to one of these colors.

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Color Blindness.

It is interesting to hear the typical color blind relate how they see. A person red blind sees black and white, and their mixture which makes gray, much the same as others do. He cannot distinguish correctly the color of any red object. If the object is very bright red, it looks like feeble green, and if feeble red, it appears black. The explanation of this, according to the above theory, is that the waves of light from a red object on entering a red-blind eye do not produce the sensation of red, because the red perceiving nerve elements are absent, but they fall on the green and violet perceiving elements. The waves of light from green objects are nearest the length of those of red objects, and the waves from bright red objects excite the green perceiving nerve elements slightly, producing the sensation of feeble green, while feeble red is not sufficiently strong to excite them, and the sensation is black or perhaps a brown.

Yellow, which is a combination of red and green, appears green to the red blind, as the red part of it produces no impression except on the green perceiving nerve elements.

Red and green objects may appear to him of the same color, only differing in intensity. An intense red and feeble green may appear to him to be of the same color.

A green blind perceives red and violet; yellow appears to be a red, as only the red part of it is seen.

Blue, which is a combination of green and violet, looks like violet. The waves from intense green excite the red perceiving elements slightly and produce the sensation of feeble red, so that an intense green and a feeble red may appear to the green blind of the same color; a green not intense enough to excite the other color perceiving elements may appear gray.

The violet blind distinguish red and green quite well, as well as yellow; blue appears to be only green. Intense violet excites the green perceiving nerve elements and produces the sensation of green, while feeble violet appears dark.

Different colored objects of glass, paper, etc., have been used in the examination of color blindness, but Prof. Holmgren's method is so much more simple and practical than the others that it alone will here be described.

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Color Blindness.

The test used in this method consists of about one hundred and fifty little skeins of Berlin wool, containing about all the different colors, and one large sample skein each of red, green and violet. A good test of this sort is furnished by N. D. Whitney & Co., Boston.

To make an examination, these skeins are spread out on a table; and to examine for red blindness, the red sample is placed to one side, and the person to be examined is requested to select from the assortment of small skeins such ones as are of the same color or shade as the sample.

The words red, green, etc., are not used. If the person is red blind he will match the sample with brown, green as well as red, and of a darker shade than the sample; but if he happens to be green blind, he will choose lighter shades of the same colors.

The green sample is then presented, and the same request made. If not color blind, he will pick out all the green samples immediately; but if green blind, will also add gray and other colors of confusion and exhibit his defect.

If asked to pick out the dark skeins he will also show his defect, and which it is for, the red or green.

Purple is a combination of red and (blue) violet. The red blind match it with blue and violet; the green blind with green and gray.

From this brief explanation of the theory of color perception and how the color blind see, the mistakes which the color blind are liable to make may be easily foreseen, and it will not be necessary to explain each case in detail.

Dalton said of his own sense of color, "My observation began with the solar spectrum or colored image of the sun, exhibited in a dark room by means of a glass prism.

"I found that persons in general distinguish six kinds of color in the solar image; namely, red, orange, yellow, green, blue, purple.

"To me it is quite otherwise; I see only two, or at most three, distinctions. These I should call yellow and blue, or yellow, blue and purple. My yellow comprehends the red, orange, yellow and green of others, and my blue and purple coincide with theirs.

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Color Blindness.

"That part of the image which others call red appears to me little more than a shade or defect of light; after that the orange, yellow and green seem one color, which descends pretty uniformly from an intense to a rare yellow, making what I should call different shades of yellow.

"The difference between the green part and the blue part is very striking to my eye; they seem to be strongly contrasted.

"That between the blue and purple is much less so; the purple appears to be blue much darkened and condensed."

Dalton was a modest Quaker. He received the degree of Doctor of Civil Laws from Oxford, and received a scarlet robe or gown which is given with this degree; and it is related that he wore it several days on the street in happy unconsciousness of the effect he produced. It is also said that his friends presented him at court in the same attire without his knowledge of the color of the garment he wore.

A color blind officer once desired to purchase a blue uniform; he chose a blue coat and waistcoat and red breeches, which he supposed matched. Another case said he could not see any difference between the red, ripe fruit on the trees and the leaves; a boiled lobster and a cucumber were to him of the same color.

Another wrote a letter, part with black ink and part with red, without being aware of any difference. Another says a red brick house and the green lawn on which it is situated are of the same color.

A color blind engraver says his defect is an advantage to him, as he sees colored objects in black and white just as he desires to engrave them. A color blind person picked up a red hot coal and asked what that funny green thing was. Another, an artist, painted a landscape with red trees. Another purchased a pair of green pants supposing they were brown. An architect copied a brown house in blue and green and made the sky above it rose color. A color blind physician says he is troubled to distinguish the color of throats, ulcers, etc., much to his chagrin. A post office clerk, who sold the stamps, found himself in trouble because he did not distinguish the red from the green stamps by their color.

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Many more cases might be related and details given if space allowed.

All these mistakes in color are curious, some of them amusing, but fortunately are neither dangerous nor destructive; but the fact, as shown by the statistics above quoted, that about one man in every twenty-five has deficient color perception, and as it is evident that some of these must be, and in fact are, among railroad employees and vessel pilots, the community should consider what danger it is in continually, and what steps it should take to avoid it. The railroad accident at Lagulunda aroused the people of Sweden to a proper estimation of this matter; examinations for color blindness commenced, and, as fast as the railroad authorities were convinced that any of their men were color blind, they took them away from positions where color perception was required, so as to protect themselves and the community from this danger; and any railroad or corporation would probably be very quick to do the same; for if an accident should occur plainly on account of the color blindness of an employee, and a claim should be made, no court or jury would be slow to bring a verdict against the corporation, because it is plain that the accident was preventable. It also seems very important that the corporations themselves should know if any of their employees are color blind, and prevent the consequent destruction of their property and the annoyance that might arise from a cause which they cannot foresee or superintend; and also that they should know that the color blind are not only born so, but that the defect also may occur after injuries about the head, after any severe illness, and after excessive smoking or drinking.

It may be asked, how many accidents have occurred on account of color blindness? The answer must be that the real cause of an accident is seldom ascertained, partly on account of the careless or partial way in which it is sought, and oftentimes because the person most likely to know the cause is lost. Also, if a color-blind engineer sees a red light and green light ahead of him, how do they look to him? Can he see them and distinguish which is red and which green? A red-blind engineer reports that he can see white,

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green and red lights, and can almost always distinguish them when very near, but cannot be perfectly sure; the red light gave him great trouble and he often ran by it. He reports that the only difference to him between the colored lamps is in the intensity of light, and that he can imitate the colored lights with a white lamp. When the light is turned up, it looks to him like a white light; when turned down a little, like a green light; and when turned down more, so as to give a weak light, it looks like a red light.

If white, green and red lanterns are placed on a table before them, such persons usually tell immediately the color of each one; the white ones seem the lightest, the green less light and the red the darkest;. but if the same lamps are shown to them singly, especially if held at a distance, it is a mere guess to them which color they see. From this it may be seen that even the color blind have a slight idea of colors; and what the person loses in the absence of correct color-perception, nature tries to compensate by giving a keener perception in the different shades of the colors which they do see. A color-blind engineer might possibly go through life and his color blindness never be discovered, but it must be readily seen that he is in constant danger; for the red light is to him so feeble that at a distance he can not distinguish it at all, and even when near to it, if he happens to look at it through steam or fog, or if it happens to be obscured by snow, he does not see it. From sunset to sunrise all vessels are obliged to carry a red light on the port side and a green light on the starboard side; these are so arranged that both lights can only be seen when the vessel is directly ahead and approaching the observer. These lights show not only the position of a vessel but also the direction in which it is going, and it must be self-evident that it is in the highest degree necessary that any one responsible for the sailing of a vessel should be able to correctly distinguish these colors.

The great majority of cases of color blindness are hereditary; consequently there is no indication that the relative number will decrease. It is transmitted from generation to generation with tolerable regularity, often overleaping one generation.

A certain family is reported in which five generations were ob-

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Color Blindness.

served; there were thirty males, of whom eighteen were color blind; and twenty-nine females, with only two color blind. Almost all color blind people have color blind relatives. Dalton had a color blind brother. Almost all European countries have recently passed laws enforcing the examination of all railroad employees and sailors, and where such laws are not yet passed, many corporations have the examinations made by their own surgeons. The examination should be made on entering the service, and also afterwards, periodically, on account of the causes of color blindness before mentioned. Massachusetts was the first of the United States to take action in regard to this matter, which she did in 1879; since then some of the other states have followed her example.

On February 17, 1880, the United States treasury department ordered all United States local inspectors of steam vessels to issue pilots' licenses only after an examination by a surgeon of the United States marine hospital service, and a correct color sense had been found.

On March 9, 1880, this order was modified so that any pilot who had previously received a license could be examined by any respectable physician, and, on his certificate, receive a renewal of his license, a license being good for one year. The penalty for serving without one is one hundred dollars, and a vessel owner who employs a non-licensed pilot is liable to the same penalty. Under this system of examination, 2,870 pilots had been examined up to June 30, 1880, and sixty-four, or about 2¼ per cent., found color blind.

The order of March 9th is evidently very unfortunate, because very few physicians have yet informed themselves sufficiently or provided themselves with the necessary material to make these examinations properly. Then one physician in twenty-five is probably color blind and incapable of making them. A pilot rejected by one physician can go from one to another till he procures a certificate and thereby secures a license, and so it happens that there are already licensed pilots now sailing who have been examined by competent physicians and found to be cases of typical color blindness. Dr. J. M. Allen, acting assistant surgeon of marine hospital

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service at Milwaukee, kindly informs me that he has examined thus far 180 pilots, and found 7, or about 4 per cent., color blind.

The surgeon general of United States marine hospital service, in his report of 1880, recommends the passage of a law making the physical examination of seamen compulsory, as a measure in the true interest of American commerce, and adds that "the dictates of humanity demand that persons suffering from color blindness be no longer allowed to jeopardize the lives of passengers on our vessels."

It is to be hoped that Wisconsin, a state forward in every good work, which has done so much to increase the number of human lives in its borders and protect them from pestilence and disease, will very soon adopt suitable measures to deliver its people from this newly discovered danger.

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THE GROWTH OF CHILDREN.

BY GEO. W. PECKHAM, M. D., TEACHER OF BIOLOGY, MILWAUKEE HIGH SCHOOL.

The investigation hereinafter reported was undertaken under the auspices of the State Board of Health; and without its generous support would have been impossible. Permission to visit the schools and make the necessary measurements was granted by the Superintendent of Public Instruction, the Hon. James MacAlister. The cards used in obtaining the data were those adopted by the Massachusetts State Board of Health, with the addition of a space for the names of the school and the grade. The following is a copy of the card issued to the various schools:

Face of Card.

Males. FOR A SINGLE SET OF OBSERVATIONS. *See the other side*

Record all linear measurements at nearest 1-10 of an inch; all weights at nearest 1-4 of a pound.

Name (or initials), ... Age, ... yrs, ... mos.

Height, without Shoes, ... Sitting height, ...

School, ... Grade, ... Weight, (in ordinary in-door clothes.) .....

Nationality of

Father, ... Color of Eyes, ... Color of Hair . ...

Mother, ... Birthplace, ...

Paternal Grandfather, ... Occupation (of parents if a minor),

Paternal Grandmother, ...

Maternal Grandfather, ...

Maternal Grandmother, ... Name (or initials) of observer,

(This card when filled is to be returned to G. W. PECKHAM, Milwaukee, Wis.) .....

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The Growth of Children.

Back of Card.

The Height is to be taken in an upright position, without shoes, the feet being close to the measuring rod. If, in the case of infants, it is necessary to measure in a recumbent position, the fact should be stated.

The Sitting Height is the vertical distance between the top of the head and the surface upon which the individual is seated.

The Weight is to be taken in ordinary in-door costume, and is to be recorded at the nearest quarter pound.

The Color of the Eyes is to be recorded as blue, gray, brown, or black.

The Color of the Hair is to be recorded as fair, golden, red, brown, black, or gray. If gray, record also, if possible, the original color.

The Nationality is determined by the place of birth.

In order to facilitate the work of tabulation, the cards used in recording the observations were of different colors for males and females. The various class teachers attended to the filling out of the cards, and in most instances the weighing and measuring was done either by the principals themselves or under them by some suitable deputy; and had it not been for the hearty and intelligent interest shown by the principals and their assistants the work could not have prospered. Measuring rods built upon firm platforms, and graduated to inches and tenths, were used in taking the heights. In obtaining the weights the Fairbanks platform scales were used, and after each transfer from school to school their accuracy was tested. The nationality (i. e., place of birth) of the parents and grandparents was ascertained through the pupils; in the upper grades they supplied the necessary information themselves; the younger children were furnished with the following blank printed in both the English and the German language, and signed by the principal of the school:

Blank.

MILWAUKEE, ——, 1881.

Dear Sir:— Will you be kind enough to fill out the blank below, and return it to me.

Give birthplace of your (son or daughter).

Give birthplace of your father (state or country).

Give birthplace of your mother (state or country).

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The Growth of Children.

Give birthplace of your paternal grandfather (state or country).
Give birthplace of your paternal grandmother (state or country).
Give birthplace of your maternal grandfather (state or country).
Give birthplace of your maternal grandmother (state or country).
Name (to be inserted by teacher).
Age, —— years —— months.
Give occupation of father.
Please give only the name of the state, as Vermont, Wisconsin; or the name of the country, as Ireland, Germany, etc., and not that of the city where the individual was born, in filling up the blank.

Respectfully,

——, Principal.

In obtaining the nationality of the ancestors we encountered a great many difficulties. Frequently it was necessary to send the blank back to the parents day after day before the questions were all answered. In some of the lowest grades the teachers sent in addition to the blanks, notes to the parents, asking their co-operation. The great care taken in obtaining the data under these headings renders them entirely reliable. The color of the eyes and of the hair was noted by the teachers in charge of the rooms, and the results will be published later. With the exception of colored and deformed children, and also the returns from one school where the height was recorded at nearest inch, all the data collected were utilized in making up this report. Besides the public schools, the following private schools furnished important data: The Female College, President Charles Farrar; The German and English Academy, Dr. J. Keller; Markham's Academy, Prof. A. Markham; The schools for boys and girls attached to St. John's Cathedral, the Rev. James Keogh (boys), and Sister Mary (girls). To these gentlemen and their associates I am under great obligations. To many of the young gentlemen of the high school I am indebted for important aid. To the secretary of the State Board, Dr. J. T. Reeve, my thanks are also due for the kindly interest which he has shown, and for the assistance which he has given me. All the work of tabulation was performed by my wife. Besides this valuable help, the usefulness of the report is materially increased by her suggestions.

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Seven groups were formed:

I. Parents both pure American.
II. Parents both American.
III. Parents one American and one German.
IV. Parents both German.
V. Parents one or both English.
VI. Parents both Irish.
VII. Irrespective of nationality.

In the first group were included all children whose parents and paternal and maternal grandparents were born in the United States; in the second, those of American parentage, the grandparents being usually either German or Irish,— very many more German, however, than Irish. The third, fourth, fifth and sixth groups need no explanation. The seventh included the first six, beside children of Scandinavian, Icelandic, Polish, Bohemian, French, Russian, and Spanish extraction. The average heights and weights were computed by professional accountants. The reasons for preferring averages to means, in constructing the curves, will be given along with some general remarks upon the laws of growth. The results of the investigation are given in tables at the end of this report. The same results have in many instances been expressed by graphic representations. On the plates, the upper curves usually show the average heights,— the lower, the weights. The figures opposite the horizontal lines on the left, the height in inches and tenths; those on the right, the weight in pounds and tenths. The numbers below the vertical lines, the different ages. The number of observations from which the results have been computed is placed at the bottom of the plate.

GROWTH.

In order to facilitate the study of the data presented in this report with regard to the growth of children, it seems desirable to offer some general remarks upon the laws of growth, using the term growth to include only those changes in the organism that result in an increase of bulk, to the neglect of those other changes which usually occur at the same time, and which more properly be-

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long to development. Writers on anthropometry have commonly studied the influence of age, sex, race, climate, occupation, and general surroundings, without sufficient regard to the physiological laws through which they act. The most important general truth for the purpose in view is that in organisms there is a universal disintegration and waste, and a concomitant reintegration, from the beginning to the end of existence. During youth the latter is in excess, and this results in growth. The increase of mase taking place at the expense of the appropriate matter surrounding the animal, would the increase be unlimited if the supply were unlimited, and the waste not correspondingly increased? But little observation is necessary to convince us that the size of any organism, and more definitely any group of organisms, is, within a certain range, limited; and that the influence which determines the amount of food that can be assimilated under the conditions supposed, is a power transmitted from parent to offspring, and known as a law of heredity, or of race or stock. Stating it broadly, we may say that the size of an organism is the result of its inherited tendency as modified by the two varying factors of waste and repair.

If we carry the analysis one step further we see that there are numerous factors which regulate the rate at which the reintegration and disintegration takes place. To the sum of these conditions the term environment is usually applied. The environment may modify the organism more at one age than at another, or one sex rather than the other; and since the nutritious matter which an animal takes in is not only the source from which the new material is obtained whereby to increase in bulk, but is also the source whence the force is derived whereby to carry on its daily work, it results that only the matter not appropriated for daily work will be left for growth. Here too the environment may act, either on the amount of food obtainable or on the cost both of acquiring and assimilating it. The general conditions of life are usually assumed to determine this relation. It is of course desirable to obtain data relative to the influence of occupation, alimentary, and hygienic conditions, and to measure definitely their power in affecting the laws of growth. Unfortunately these data are lacking in the valu-

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able mass of statistics published in the country by Baxter, and also in those published by Gould. Even in the statistics of Bowditch and myself, where we know the occupation, the hygienic conditions are by no means easily determined, and at best are matters of inference.

After a very careful study of these reports it has occurred to me that by far the greater portion of an individual's surroundings are determined for him by the degree of density of population in the locality in which he lives. Hence when the density of the population is known, we obtain more information concerning the comfort or misery of existence in any place than it is possible to obtain in any other way. This is not the same as estimating the effect of urban or rural life, nor yet of the different general classes of occupation; it includes both of these, and considerably more. The density determines, in a general way, the occupations of the larger portion of the inhabitants of any district. It further modifies the condition of the atmosphere and of the soil, and the amount of obtainable food. Where the concentration of the population is excessive, the difficulties in the way of proper ventilation and sewerage are almost unmanageable. Shoemakers living in the villages throughout the state, are certainly more favorably situated than those working in the big shops of this city. Density, it would seem, is accompanied by more important modifying influences than any other obtainable fact.

I do not wish to be understood as supposing that there is a decrease of height in a district in direct proportion to the density of the population in that district, but only that, race, sex, and age, out of view, the degree of density appears to be the most important factor in determining the size of individuals. Dr. Wm. Farr has shown that the mortality of districts increases as the sixth root of their densities. The same train of circumstances that accompany, or are the effects of concentration of population, and result in an increase in the mortality, may exert as marked an influence upon the rate of growth. I hope to be able to show that the difference

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between the heights of the natives of the different states as pointed out by Dr. Gould,[1] may be in part explained in this way.

Since the phenomena of growth are so complex, modifying in so many ways each other's effects, it will be necessary to consider each separately, and finally to endeavor to assign the value of each in the total result. I shall examine the facts in the following order: In relation to age, sex, race, climate, and the influence of density of population.

Since averages have been used in this report, rather than means, it seems incumbent upon me to give my reasons for departing from so well established a custom. We have here to do with the same Platonic idea that Prof. Owen has made so much of in osteology, thereby causing an amount of metaphysical theorizing that for a long time threw morphology into confusion. Quetelet adopted the Platonic notion that before man was created there must have existed in the Divine mind a model according to which the human being was formed; and further, that by eliminating the effects of accidental influences, we could discern the archetypal form. Quetelet says: "A large number of naturalists and philosophers have attempted to prove, by a course of reasoning which is more or less conclusive, *the unity of the human species.* I believe that I have succeeded in demonstrating not only that this unity exists, but that our race admits of a type, or model, the different proportions of which can be easily determined." Gould more clearly enunciates this idea in his discussion of the difference between a mean and an average. "Now," he says, "we may regard the laws of Nature, to which the Supreme Being has assigned the duty of carrying out his creative mandates, as occupying, in the almost infinitely varied circumstances under which they find application, a position analogous to that of marksmen aiming at a target. There exists, for plant, and beast, and man, a type, not necessarily clothed with a material body, yet none the less a real entity. And

[1] Investigations in the Military and Anthropological Statistics of American Soldiers. By Benjamin Apthorp Gould. New York: 1869. p. 125.

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as, among hundreds of thousands of shots, no single one may centrally strike the target, while their grouping may indicate its center with a precision greater than our senses permit us to appreciate, so, by a sufficient number of measurements, under circumstances sufficiently varied, upon a sufficient number of subjects, we may arrive at a knowledge of the form and dimensions of the ideal, typical plant, or animal, or man, to which all individuals are approximations, although no one of them may ever have attained, or hoped to attain, its accurate impersonation." "Applying these principles to the present investigation, we see that there is a human type to be sought, though attainable only by the combination of results from many races; a type of race, attainable through the study of many nationalities; a type of nationality, and a type of each class within its bounds." "Thus it is that we may hope to discover the type of humanity, as well as the types of the several classes and races of men. In the present research we are dealing only with some of his external physical manifestations, but we aim at the deduction of the numerical expressions of these as a step toward constructing the typical or average man, who, though probably never clad in flesh, is yet a reality, not merely existing in the Divine mind, but capable of perception and recognition by human sense."[1]

Dr. Roberts, in his excellent manual of Anthropometry, when pointing out the importance of means, seems partly under the thrall of this idea when he says: "These regular oscillations around the same type are observable from the very instant of birth, only their limits become more confined the nearer we approach that period; as if nature, acting alone, was loth to deviate from its type, and as if the greatness of the variations arose chiefly from the modifying influence of man." "The mean height is the central or typical height which the men possess; and is the height which all of them *ought to be*, and probably would be, if their growth had not been interfered with by accidental causes.'

[1] Op. cit., pp. 244, 246.

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From this I should suppose Dr. Roberts to mean that the variation from the type brought about by the accidental causes produces in the lower groups men who are too short, and in the upper groups men who are too tall. This can only be true when we have in mind an ideal man. Judging in this way it must frequently happen that more than half of the individuals in a series of observations are both too tall and too heavy for the ideal notion. If we leave out of view this anthropomorphic conception, which it is possible Dr. Roberts would be willing to do, what is there in a mean that makes it superior to an average? The two forces that have resulted in the formation of the several races of men are heredity and the influence of the environment. The racial factor may be readily determined by appropriate inquiry; the influence of the external conditions remains to be determined. Suppose that we knew the race of a thousand men. They would tend to inherit a certain height. The modification of this tendency by climate, occupation, etc., might either accelerate their growth, giving a greater height than that of their ancestors, or it might result in a decrease in size. If more than half of these men happened to be more favorably situated than their fellows, the "mean man" would be tall; or it might quite as easily happen that the reverse would take place, and then he would be short. Let us take the illustration used by Dr. Roberts. The table represents the heights from actual measurement of 430 English school boys, eleven years of age.

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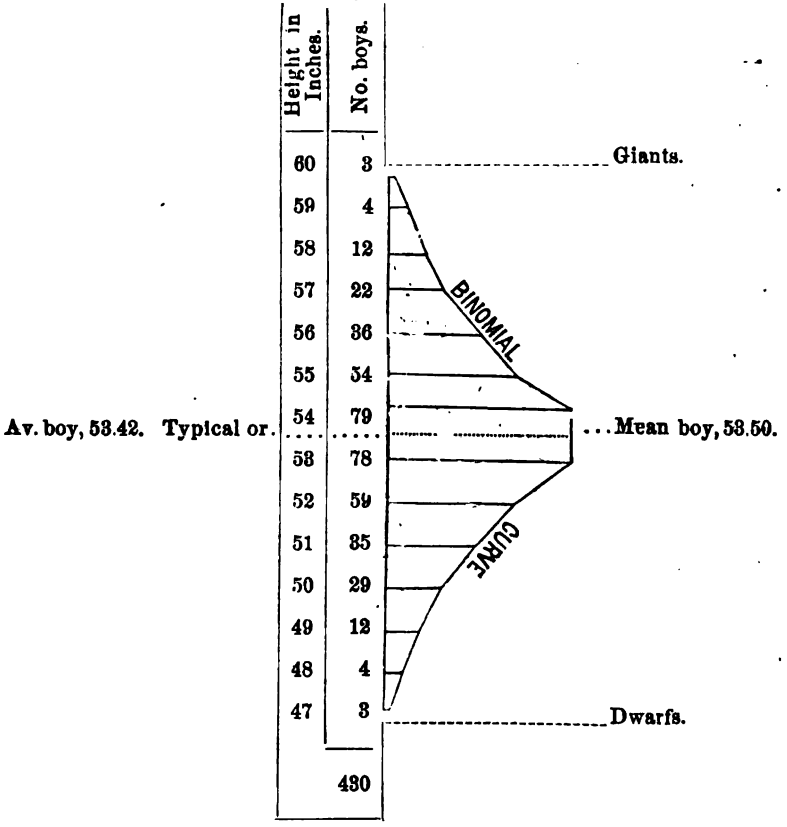
The Growth of Children.

DIAGRAM I.



If the 79 boys, 54 inches, and the 78 boys, 53 inches high, happen to be lads from a select school, who have had better home surroundings hygienically, than the others, we should certainly get no fair idea of the height of the general run of boys in that locality, but rather the height of the 157 most happily situated.

I add, for purposes of comparison, a table representing the heights of 936 Boston school girls, eleven years of age. (Constructed from Dr. Bowditch's table.)

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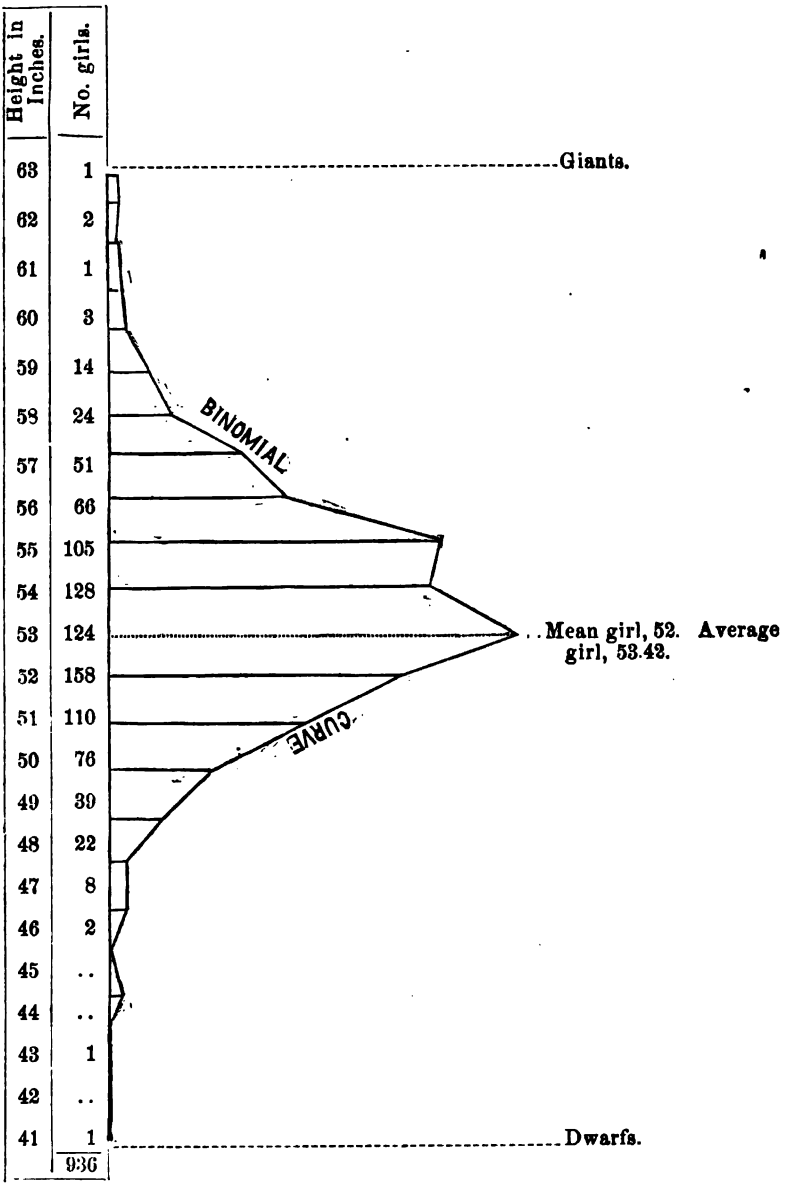
The Growth of Children.

DIAGRAM II.



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The Growth of Children.

In the table constructed by Dr. Roberts the numbers arrange themselves according to a very uniform rule; but in the table that I have added the results are by no means satisfactory.[1] The mean here probably represents a group of unfortunately conditioned girls, and is in no sense median nor standard, there being 519 higher than the mean, while there are only 259 lower.[2] The average would eliminate any marked deviation favorable or unfavorable to growth, and would show how the general conditions at that time and place modified the racial tendency. "The calculation of an average from a comparatively few individuals," as suggested by Dr. Tylor, "would be worthless," but would the mean under similar conditions be more useful? What we seek, it seems to me, is the total result of the action of the environment upon the inherited tendency. Sir J. Herschel remarks that a mean involves the conception of a central magnitude and the regular march of the groups increasing to a maximum and then again diminishing.[3] "But suppose that the groups were groups of men of different occupations; then we should have either the largest group (possibly farmers), the maximum height, or the strongest group, numerically considered, might fall in the higher or lower numbers of inches. The mean would give the inherited tendency as modified by a certain kind of occupation. On the contrary the average would show the modifying

[1] Dr. Roberts, in utilizing these observations to form a table (Table No. X in his Anthropometry), erroneously gives the mean as 53.50 instead of 52 inches. A reference to Diagram II shows that the greatest number of observations (158) falls at 52 inches; while he draws the mean line (53 50) between 124 and 128 observations. In several other places in this table his means are formed in an equally arbitrary manner.

[2] Dr. Bowditch remarks that in his tables the figures do not increase and diminish with the regularity which a conformity to Quetelet's law demands; but that his observations at each age are comparatively few in number, and that more numerous measurements, or a distribution of the observations in larger groups would doubtless cause the appearance of a closer agreement with the law. But when we remember that Dr. Bowditch's observations number over twenty-four thousand, the obtaining of a larger number seems almost impracticable.

[3] Edinburgh Review, No. CLXXXV, July, 1850, Vol. XCII, p. 1.

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influence of all the occupations, and under the given circumstances the height to which any individual might attain. When the data as to race are unknown the mean would, of course, be useful. Gould shows that the height for sailors at all ages is less by more than an inch than that for soldiers.[1] If investigating the growth of men in a sea-board town where the landsmen were more numerous than the sailors, could we fairly say that all the men ought to reach the mean height — probably that of the more favored class of landsmen?

The practical advantage suggested by Dr. Roberts that means give a more uniform curve, seems to be an error. When the number of observations is large enough, the average gives the more regular curve. I add a series of means and of averages for Boston school girls of ages from five to eighteen years, to show how irregular the mean curve would be:

AGE.	5	6	7	8	9	10	11	12	13	14	15	16	17	18
No of observations	605	987	1199	1299	1149	1039	936	935	830	675	459	353	233	155
Average height...	41.19	43.35	45.52	47.58	49.39	51 34	53 42	55.88	58.16	59.94	61.10	61.59	61.92	61.95
Mean height.	41	43	45	46.50	49	51	52	55.50	59	60	61	61.50	62	61.50

The conclusion of Quetelet that means render a large number of observations unnecessary, is clearly disproved by Dr. Bowditch. When the number of observations is large enough, and the material perfectly homogeneous, the difference between the mean and the average would probably be little, if any; but when, as is usually the case, the material is somewhat heterogeneous, the mean and the average may differ considerably (in the instance of 936 eleven year old Boston girls, nearly an inch and a half). The adoption of the mean height as representing the height of any number of individuals seems entirely arbitrary, and must often lead to very untrustworthy results.

[1] Op. cit., p. 132.

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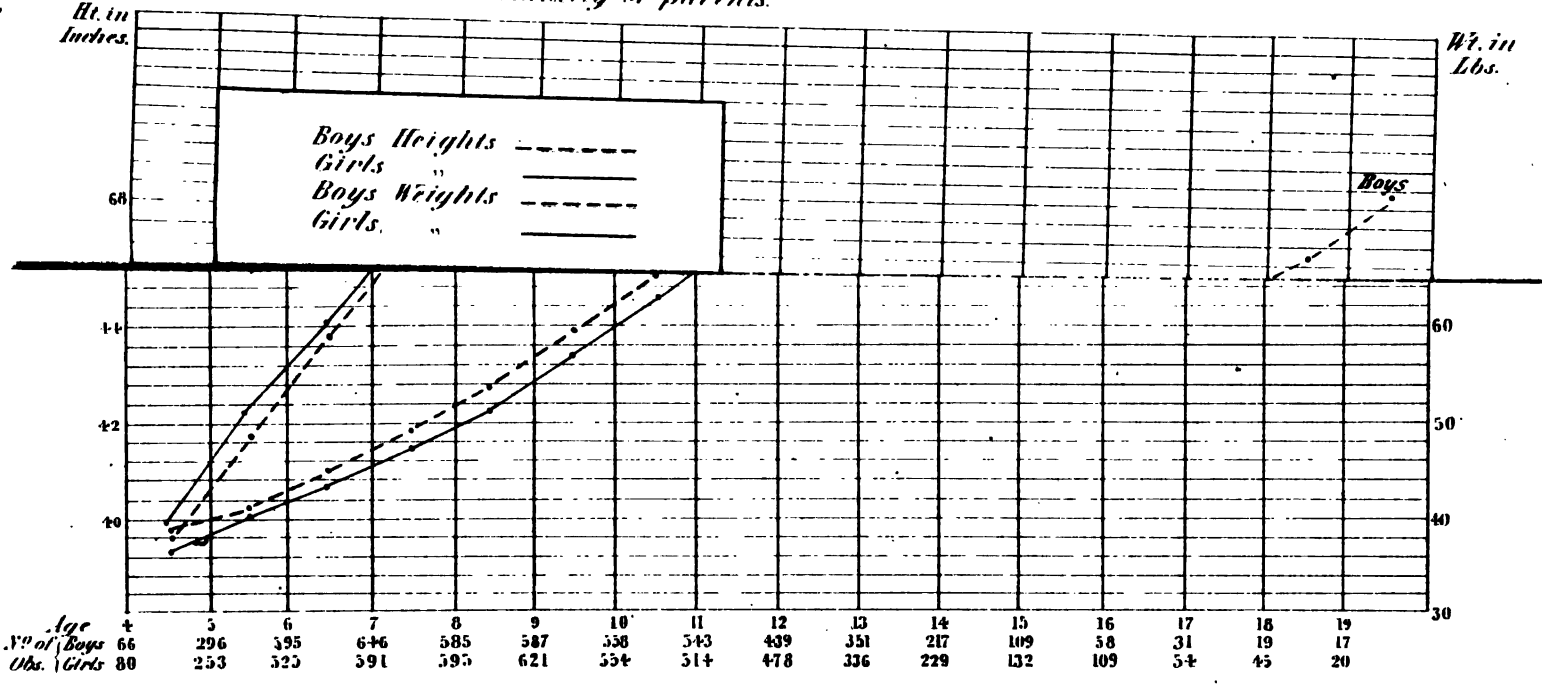
Plate I Showing rate of growth in Milwaukee school children. Whole number of observations irrespective of nationality of parents.



Age	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
No of Obs. Boys	66	296	395	646	585	587	558	543	439	351	217	109	58	31	19	17
No of Obs. Girls	80	253	525	591	595	621	554	514	478	336	229	132	109	54	45	20

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The Growth of Children.

COMPARATIVE RATE OF GROWTH OF THE TWO SEXES.

Plate I shows that until about the twelfth year boys are taller than girls, and that until the thirteenth year they are heavier; after that age the girls are both taller and heavier than the boys to about the fifteenth year. The girls are therefore taller during a period of three years, while they are heavier for about two and a half years. Plate II shows the same fact with regard to children of German parentage. Here, however, the girls are heavier for a still shorter time — scarcely two years. These results agree with the curve of growth as established by Dr. H. P. Bowditch of Boston.[1] Here, the highest rate of growth occurs during the eleventh and twelfth years. Pagliani found that girls grow fastest during the twelfth and thirteenth years. "This discrepancy Pagliani explains "— as between the girls in Boston and Turin —"by a difference in the age of puberty, which he assumes to arrive earlier in Boston than in Turin."[2] I regret that I can offer no data with regard to the age of first menstruation in this city. It is highly probable that girls in this locality differ little, if any, in this respect from girls in Boston. Chadwick's table gives the average age as nearly fourteen and a half years. Dr. Bowditch's supposition that this difference in the age at which the rate of growth attains its maximum in the two sexes shows a connection of the phenomenon with the period of puberty, seems certainly established. Herbert Spencer says: "So familiar is the fact that sexual genesis does not occur early in life, and in all organisms which expend much begins only when the limit of size is nearly reached, that we do not sufficiently note its significance. It is a general physiological truth, however, that while the building up of the individual is going on rapidly, the reproductive organs remain imperfectly developed and

[1] See Report on the Growth of Children, by H. P. Bowditch, M. D. (Eighth Report of the State Board of Health of Massachusetts). This is by far the ablest contribution to this subject thus far published.

[2] Human Growth, by Chas. S. Minot, M. D., Boston Medical and Surgical Journal, July 22, 1881. In this article Dr. Minot gives a resumé of Prof. Pagliani's memoir on growth.

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inactive, and that the commencement of reproduction at once indicates a declining rate of growth, and becomes a cause of arresting growth."[1]

The table of annual increase (Table No. 8) shows that the least increase, with the exception of the eighth year, occurs at the year of puberty. While the increase at seven years was 2.15 inches, and at nine years was 2.22 inches, at eight years it was only 1.66 inches. Would the eruption of the permanent incisors and the greater nervous susceptibility of girls at this age partly explain the falling off in the rate of growth? The retardation in Boston girls of this age is not clearly marked. The acceleration of the rate of growth in girls preceding puberty is just what would be expected from a study of the laws of growth. Quetelet certainly erred in considering it a "pathological result of civilization;" and since it occurs in England, Italy, Boston, and Milwaukee, it would seem to be independent of either race or climate, and to be a general sexual law of growth.

RACE, AS AFFECTING HEIGHT AND WEIGHT.

Plate III shows that Milwaukee school boys of pure American parentage, at all ages with the exception of four and six, are about half an inch taller than boys of German parentage. Plate IV, giving the curve for girls of pure American and of German parentage, gives the same result; the pure American girls, however, being taller at all ages. Plates V and VI illustrate the rate of growth in height for children of German, American and German, American, and pure American parentage. An examination of the curves will show that the German boys, at all ages excepting four, six and twelve, are the shortest. The boys of mixed American and German parentage are at nine ages taller, and at three shorter, than the Germans. The Americans (grandparents commonly German) are nearly always above the Germans, and cross the American and German line at six different places. The termination is above both of the others. The pure American, beginning at the tenth year, is,

[1] Biology, vol. II, p. 436.

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on the whole, above the other three. From the sixteenth year the superiority of the American above the German, and of the pure American above both, is well marked. Plate VI shows, after the tenth year, the influence of American stock in girls. It is unfortunate that the number of observations is not greater, but all the observations we have point to the same conclusion — that there is a tendency in American children, both boys and girls, to reach a greater height than German children; and that the tendency varies as the purity of the American stock varies. The same is true of the American and German children in Boston, as is shown by Dr. Bowditch. The tables at the end of the paper show that Americans are nearly always taller than children of Irish parentage, both here and in Boston, and that the Irish, in this respect, excel the Germans.

The researches of Drs. Baxter and Gould from the seventeenth year upwards, demonstrate the superiority in height of natives of Wisconsin over natives of Germany and Ireland living in America. The data of Dr. Bowditch for Boston, extending from the fifth to the nineteenth year, and my own from the fourth to the nineteenth year, supplementing the other data, prove the greater height of Americans at all ages as compared with the Germans and the Irish; and the greater height of the Irish as compared with the Germans. Plate VII, modified from Gould's report, presents the curve for these races from the seventeenth year to the twenty-sixth. Tables 9 and 10 present these facts for Boston and Milwaukee. The influence of race upon height is, it would seem, clearly established. With regard to the influence of race upon weight, Plates III and IV, for German and pure American boys and girls, show that previous to the sixteenth year for girls, and to the seventeenth for boys, the curves cross and recross several times, the Germans having the greater weight at their termination. On the whole, the Germans also weigh more than the Irish.[1] An inspection of the tables leads to no definite conclusion as to the influence of race upon the

[1] Both Drs. Beddoe and Bowditch have noted that Germans are heavier in proportion to their height than other nationalities.

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weight of children in this place.[1] In Boston the American boy or girl is heavier than either the German or the Irish. It may be taken, then, as fairly established that race or stock is a very important element in determining height; and further, that its influence is marked at all ages.

These observations, so far as they go, tend to the opinion that the effect of cross-breeding is that the offspring take the height of the taller parent, and is, on the whole, increase of stature. Dr. Beddoe remarks: "The results of my tables tend to support, but only in a feeble way, the current opinion as to the advantageous effect of crossing upon size.[2]

In Tables 13 and 14, showing the ratio of weight to height for Boston and Milwaukee children, the Milwaukee children in the American column are of pure American ancestry.

[1] Weight of the Body. "Its causes are various, such as hygiene, food, character of occupation, temperament and race. The probable connection between these last two makes it the more difficult to consider the question of race by itself." Anthropology, by Dr. Paul Topinard, p. 398.

[2] Stature and Bulk of Man in the British Isles, by John Beddoe, B. A., M. D., etc., London, 1870, p. 171.

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Plate III Showing rate of growth in Milwaukee school boys of American & of German parentage.

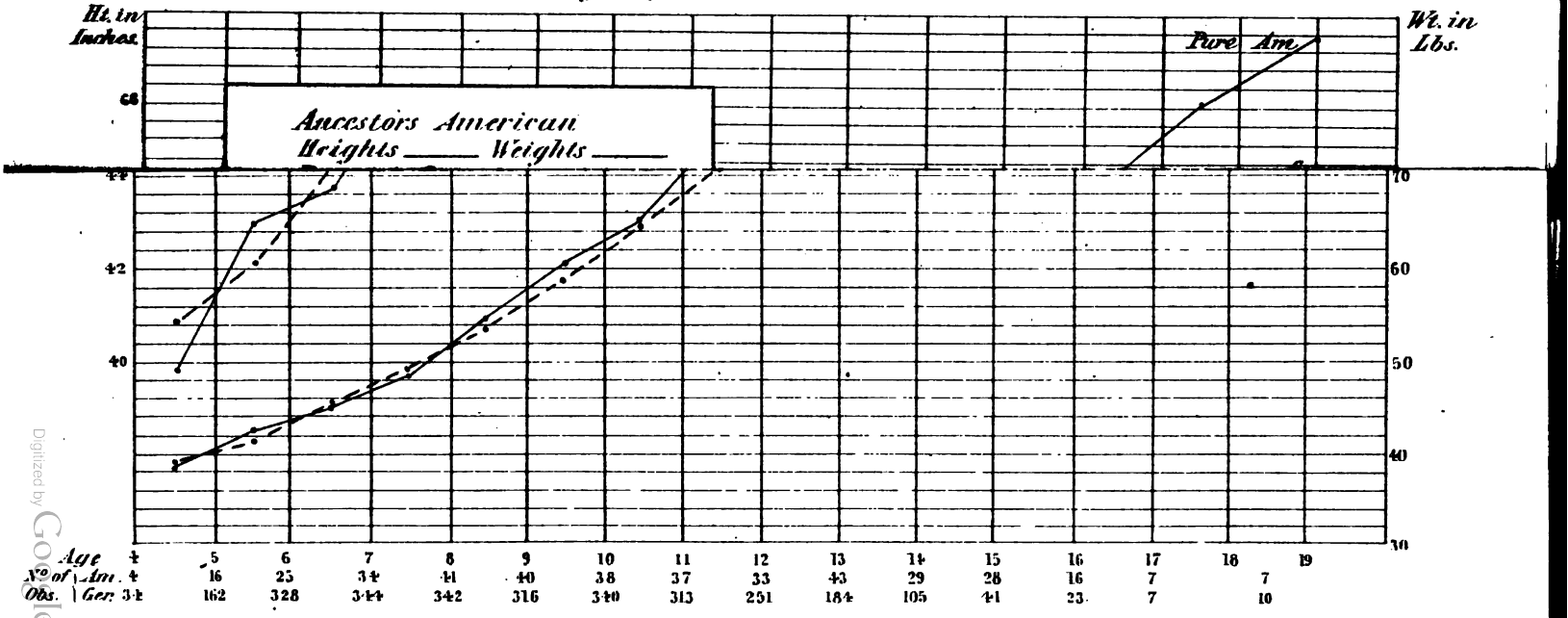

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TABLE No. 9.— *Showing Comparative Rate of Growth in Height of School Boys in Boston and in Milwaukee.*

AGE AT LAST BIRTHDAY.	PARENTAGE.									
	American. Heights, inches.		German. Heights, inches.		One or both English. Heights, inches.		Irish. Heights, inches.		Irrespective of Nationality. Heights, inches.	
	Boston.	Milwaukee.	Boston.	Milwaukee.	Boston.	Milwaukee.	Boston.	Milwaukee.	Boston.	Milwaukee.
Five	41.74	42.96	41.08	42.13	41.40	41.86	41.59	41.76	41.57	42.28
Six	44.10	43.75	43.50	44.20	43.64	43.92	43.74	44.80	43.75	44.08
Seven	46.21	46.18	45.25	46.06	45.60	46.06	45.61	46.76	45.74	46.09
Eight	48.16	48.32	47.13	48.01	47.50	48.52	47.72	47.75	47.76	48.05
Nine	50.09	50.64	48.85	49.86	49.39	49.83	49.53	50.21	49.69	50.00
Ten	52.21	52.37	51.21	51.78	51.62	51.89	51.57	51.72	51.68	51.85
Eleven	54.01	55.26	52.92	53.57	52.81	53.82	53.10	54.42	53.33	53.76
Twelve	55.78	56.35	54.55	54.93	54.89	55.91	54.82	55.09	55.11	54.98
Thirteen	58.17	57.79	56.70	57.19	56.76	58.59	56.70	56.44	57.21	57.47
Fourteen	61.08	59.62	59.14	59.15	59.40	60.37	58.88	59.61	59.88	59.89
Fifteen	62.96	62.66	62.06	61.96	61.48	63.81	61.15	63.18	62.30	62.34
Sixteen	65.58	66.70		63.66	63.88	67.46	64.09	63 50	65.00	65.07
Seventeen	66.29	68.01	64.75	66.25	.....	66.10	66.20	66.30	66 16	66.60
Eighteen	66.76	70.05		65.45	.....	.....		68.40	66.66	67.44

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TABLE No. 10.—*Showing Comparative Rate of Growth in Height of School Girls in Boston and in Milwaukee.*

AGE AT LAST BIRTHDAY.	PARENTAGE.									
	American. Heights inches.		German. Heights, inches.		One or both English. Heights, inches.		Irish. Heights, inches.		Irrespective of Nationality. Heights, inches.	
	Boston.	Milwaukee.	Boston.	Milwaukee.	Boston.	Milwaukee.	Boston.	Milwaukee.	Boston.	Milwaukee.
Five	41.47	41.72	41.40	40.54	41.14	42.75	41.18	41.78	41.29	41.72
Six	43.66	43.51	43.09	43.42	43.32	44.72	43 29	43.99	43.35	43.78
Seven	45.94	45.76	44.91	45.86	44.81	46.06	45.45	46.53	45.52	45.93
Eight	48.07	48.36	47.15	47.39	47.63	47.25	47.39	47.06	47.58	47.59
Nine	49.61	49.87	49.20	49.76	49.37	50.37	49 27	50.86	49.37	49.81
Ten	51.78	52.08	50.76	51.84	50.98	52.65	51.20	52.13	51.34	51.89
Eleven	53.79	55.15	52.62	53.46	53.63	54.82	52.13	54.26	53.42	53.80
Twelve	57.16	57.08	54.73	55.83	55.89	56.99	55.41	56.52	55.88	56.47
Thirteen	58.75	59.46	57.82	58.22	57.71	59.50	57.64	58.99	58.16	58.68
Fourteen	60.32	60.93	58.55	59.95	60.15	60.71	59.67	60.63	59.94	60.50
Fifteen	61.39	62.01	59.81	61.15	60.93	61.54	60.47	61.81	61.10	61.59
Sixteen	61.72	62.10		61.97	62.17	62.07	61.05	62.86	61.59	63.16
Seventeen	61.99	62.65		62.75	.....	62.76	62	64.54	61.92	62 91
Eighteen	62.01	62.66	.....	.....	.....	63.08		.....	61.95	62.53

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TABLE No. 13.—*Showing Ratios of Weight to Height, of School Children in Boston and in Milwaukee.*

BOYS.

AGE.	PARENTAGE.									
	American. Pounds per inch.		German. Pounds per inch.		One or both English. Pounds per inch.		Irish. Pounds per inch.		Irrespective of Nationality. Pounds per inch.	
	Boston.	Milwaukee.	Boston.	Milwaukee.	Boston.	Milwaukee.	Boston.	Milwaukee.	Boston.	Milwaukee.
Five	.987	.984	.987	.986	.967	.978	993	.978	.988	.971
Six	1.023	1.033	1.013	1.023	1.031	.966	1.034	1.030	1.032	1.076
Seven	1.070	1.042	1.085	1.067	1.057	1.051	1.072	1.056	1.072	1 065
Eight	1.130	1.128	1.123	1.124	1.119	1.112	1.134	1.122	1.129	1.119
Nine	1.197	1.191	1.192	1.179	1.185	1.225	1.189	1.182	1.191	1.189
Ten	1.276	1.249	1.248	1.252	1.260	1.243	1.260	1.308	1.263	1.260
Eleven	1 340	1.344	1.305	1.321	1.270	1.343	1.310	1.313	1.315	1.319
Twelve	1.431	1.429	1.388	1.379	1.373	1.371	1.381	1.431	1.395	1.383
Thirteen	1.517	1.480	1.477	1.475	1.492	1.481	1.461	1.407	1.482	1.477
Fourteen	1.625	1.500	1.570	1.604	1.561	1.540	1.548	1.589	1.585	1.598
Fifteen	1.760	1.695	1.732	1.762	1.646	1.906	1.655	1.747	1.719	1.749
Sixteen	1.885	1.854		1.867	1.883	2.019	1.761	1.791	1,861	1.875
Seventeen	1.941	1.907	1.952	1.996	.....	2.121	1.924	1.870	1.927	1.957
Eighteen	1.988	1.816		2.094	.....	.....		2.211	1.988	2.042

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TABLE No. 14.— *Showing Ratios of Weight to Height of School Children in Boston and in Milwaukee.*

GIRLS.

AGE.	PARENTAGE.									
	American. Pounds per inch.		German. Pounds per inch.		One or both English. Pounds per inch.		Irish. Pounds per inch.		Irrespective of Nationality. Pounds per inch.	
	Boston.	Milwaukee.	Boston.	Milwaukee.	Boston.	Milwaukee.	Boston.	Milwaukee.	Boston.	Milwaukee.
Five	.960	.947	.959	.999	.947	.946	.962	.937	.965	.959
Six	1.003	.975	.990	.995	.998	1.206	.998	.974	.998	.987
Seven	1.045	1.021	1.030	1.023	1.032	1.021	1.048	1.039	1.042	1.026
Eight	1.101	1.091	1.073	1.072	1.101	1.054	1.093	1.055	1.093	1.068
Nine	1.159	1.129	1.166	1.115	1.133	1.125	1.152	1.178	1.156	1.133
Ten	1.237	1.184	1.178	1.211	1.197	1.285	1.203	1.211	1.214	1.203
Eleven	1.306	1.300	1.284	1.273	1.301	1.300	1.276	1.273	1.288	1.279
Twelve	1.423	1.453	1.393	1.354	1.382	1.403	1.374	1.392	1.401	1.378
Thirteen	1.552	1.540	1.484	1.488	1.497	1.547	1.487	1.501	1.534	1.498
Fourteen	1.663	1.576	1.518	1.590	1.641	1.590	1.614	1.593	1.642	1.613
Fifteen	1.766	1.707	1.691	1.727	1.733	1.683	1.661	1.700	1.736	1.718
Sixteen	1.830	1.726		1.816	1.800	1.678	1.778	1.919	1.819	1.778
Seventeen	1.869	1.836		1.918	.....	1.783	1.870	1.773	1.865	1.801
Eighteen	1.867	1.863	.....	.....	.....	1.854		.....	1.859	1.798

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CLIMATE, AS AFFECTING HEIGHT AND WEIGHT.

That climate has any considerable effect in modifying growth, in face of the facts seems quite improbable. Theoretically, a low temperature ought to stunt men, since a large amount of energy would be expended in maintaining the bodily heat; and the further strain upon the digestive system to provide the large quantity of food necessary for this purpose would leave a smaller surplus for growth. The evidence, however, so far as we can disentangle it, does not justify this inference. Taking a wide survey of the facts, we find that the Western Esquimaux, the Negroes of Guinea, the Australians, the Patagonians, and the Kaffirs, all have an average height of over 170 metres. In Europe the non-dependence of stature upon latitude is patent. For South America, D'Orbigny discarded this theory most emphatically.[1] Dr. Baxter's table showing order of superiority in stature, by states, of American-born white men is a remarkable series of observations for refuting the supposition.[2] The evidence is more conclusive when we tabulate the statures according to the congressional districts in the different states, and eliminate the racial element: since the climatic difference between one congressional district and another in the same state is insignificant, and yet there is a good deal of variation in the stature. The same is true, in many cases, when the states are compared with each other. The table below shows the non-dependence of the stature on temperature, altitude or any of the elements of climate. Vermont, New Hampshire and Maine have almost identical climatic conditions, and have a population exceedingly homogeneous: the Germans are entirely absent, and the Irish are evenly divided among the three states; and yet we find a difference of over one inch between Maine and New Hampshire, while Vermont and New Hampshire differ by more than half an inch.

"The idea that climate, *per se*, has any influence upon stature, is very little supported by our materials. At the first blush, we

[1] Gould, Op. cit. p. 131.

[2] Statistics, Medical and Anthropological. By J. H. Baxter, A. M., M. D., Washington, 1875, p. 24.

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might be disposed to think that a northern position, and a somewhat rigorous climate, operated favorably, probably by natural selection. But Cornwall furnishes a counter exception too conspicuous to be disregarded. And the climate of Upper Galloway, where the tallest men are found, is, compared with that of Scotland in general, rather mild than severe. Kerry, again, has the mildest climate in Ireland, but its people are physically superior to those of Connaught, the climate of which differs in no wise from that of Kerry, except in being rather colder and less genial. Climate, where it does influence the breed of men, probably does so either through natural selection, or by affecting his food and mode of life."[1] (Dr. Beddoe.)

TABLE *Showing Order of Superiority in Stature, by States, of* 315,620 *American-born White Men.*

Order of superiority.	State.	Number of men examined.	Mean height, inches.	Order of superiority.	State.	Number of men examined.	Mean height, inches.
1	Kentucky	4,252	68.67	14	Maryland	6,918	67.81
2	Kansas.....	729	68.55	15	Ohio.....	39,311	67.78
3	Minnesota.....	3,682	68.37	16	Vermont	3,374	67.58
4	Missouri	6,031	68.33	17	Delaware.....	1,215	67.49
5	California	1,308	68.30	18	Pennsylvania..	47,124	67.47
6	Nevada	21	68.28	19	Dist. Columbia.	2,883	67.35
7	Indiana	38,354	68.08	20	Rhode Island..	3,013	67.29
8	West Virginia.	5,187	68.00	21	New York	43,798	67.27
9	Wisconsin.....	10,922	67.91	22	New Jersey ...	17,084	67.02
10	Maine.....	12,363	67.89	23	N. Hampshire.	2,801	66.92
11	Iowa	7,823	67.89	24	Massachusetts .	6,230	66.89
12	Illinois	36,465	67.83	25	Connecticut ...	2,099	66.58
13	Michigan	12,583	67.82				
	Total and mean of total					315,620	67.67

Dr. Baxter, in discussing this table, and the peculiarity that the height of foreigners is greater in every instance than the mean height ascribed to the nation represented, is inclined to attribute the difference in height to a difference in the age of the

[1] Op. cit. p. 173.

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men examined. Dr. Gould has shown that after taking age, etc., into consideration, the difference still exists. He has also shown that emigrants from the eastern to the western states are taller than the natives remaining at home.

An inspection of Plates VIII and IX shows the marked superiority in height of the Milwaukee boy and girl, irrespective of the nationality of the parents, over the Boston boy and girl. The boys are taller at all ages except the twelfth year, and the girls at all ages. The difference between the boys is not so marked as it is in the case of the girls. The Milwaukee girl is nearly one-half inch taller at all ages; increasing at the seventeenth and eighteenth years to a whole inch. The boys from four to twelve are about one quarter of an inch the taller. From twelve to sixteen the difference falls to less than a tenth; and then again increases, and at eighteen is three-quarters of an inch. My tables thus demonstrate the superiority in height of the western boy and girl over their Boston cousins. Plates X and XI present the same facts for children of German parentage; the Milwaukee German exceeding the Boston German to a still greater degree. Tables 9 and 10 show for Americans in Boston and in this city a less marked difference. For boys from eight to thirteen the Milwaukee Americans are above; from thirteen to fifteen the Boston Americans have the advantage At sixteen years the Milwaukee boys are an inch the taller, and at seventeen and eighteen years, more than an inch and a half. The American girls here are taller at all ages than in Boston, excepting the sixth, seventh and twelfth years. After the fourteenth year they are about one-half inch taller. The same tables present generally similar facts for children of the Irish and the one or both English groups.

The curves of weight for the totals of Milwaukee and Boston boys from five to thirteen, nearly agree. After this age the Milwaukee lads average from two to four pounds heavier than those in Boston. The Boston girl is from one and a half to two pounds heavier at all ages except five, fifteen and sixteen. Among the Germans, both boys and girls have a greater weight in this place than in Boston. The pure American boy here is heavier at nine

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ages and lighter at five ages than the Boston boy; while the girls are lighter at nine ages and heavier at five — exactly the reverse of the boys. The Irish of both sexes are generally heavier in Milwaukee than in Boston, and the same is true for the groups one or both English, with more exceptions in the case of the English girls.

Inasmuch as these children are arranged in similar racial groups, and are of the same ages, the media — including occupation — must be the causes of this difference. Occupation I think we may fairly leave out of view, since the occupations of the parents of the children here and in Boston cannot be very different. I think that this is true not only of the children as a whole, but that it holds within the different groups. If the occupation indicates, as far as is possible, the degree of comfort or misery in which the children live, we shall have to fall back upon climate or upon my proposed explanation, the density of population as modifying the dimensions of both children and adults. Dr. Gould's statement that there is a something in the western as compared with the eastern states that produces greater height, is strikingly confirmed, so far as Boston and Milwaukee children are concerned, by these investigations. To return to the problem of the effect of climate. A study of the state of Kentucky reveals the fact that congressional districts Nos. 1, 3, 4 and 7, having headquarters at Paducah, Bowling Green, Lebanon and Lexington, respectively, with little or no climatic difference, and an American population, differ by more than an inch among the several districts. On the other hand, in Lebanon, Ky., latitude 37°, and Bangor, Me., latitude 45°, the average stature differs by only nine one-hundredths of an inch, with the population fairly conformable. Walker's Atlas[1] and Baxter's Report[2] studied together give abundant proof of the non-dependence of stature on climate. The population of the United States is so exceedingly complex, so many different nationalities entering into its composition, that all statements must be made in a general

[1] Statistical Atlas of the United States, by F. A. Walker, Washington, 1874. Plates of Physical Features of the United States.

[2] Op. cit. vol. II, pp. 24, 25, 507, 510.

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manner. With this qualification I will proceed to the discussion of density of population as modifying the dimensions of man.

DENSITY OF POPULATION, AS AFFECTING GROWTH.

In my preliminary remarks with regard to the importance of this element, it was noted that its action is marked in two directions: it modifies, first, the hygienic conditions of the whole population, controlling the influence of occupation; second, the intensity and character of the struggle for existence.

The numbers which represent the average density of population in any state, only afford useful indications inasmuch as the population within the described state is very unevenly divided among the different portions of the state. In studying the distribution of the population, I have used Walker's charts for the year 1860, and also his plates of foreign population.[1] Walker forms five groups of density of population: I. 2–6; II. 6–18; III. 18–45; IV. 45–90; V. 90+, to the square mile. These groups are, broadly speaking, also groups of occupation, especially the first three. Walker shows that in this country agricultural pursuits will support a population not greater than 45 persons to the square mile. A greater number per square mile indicates the presence of manufacturing and commercial interests. The cities would be formed of many groups of both in-door and out-door occupations.

Dr. Baxter's statistics were all obtained by congressional districts, and the number of men from the different districts within the states differed very considerably. In estimating the effects of concentration of population this is a very important element. The eastern portion of a state might have a density of 100 per square mile; the western not more than 20 per square mile. If 4,000 men were enlisted in the state — 3,000 from the densely settled portion and 1,000 from the sparsely settled, the average stature for the whole would give results, for the purposes in view, almost worthless. In order to facilitate the study of the effects of density of population, I have tabulated the states[2] according to order of

[1] Op. cit.

[2] Nevada and the District of Columbia are omitted; the former because the number of observations is too small (only 21); the second on account of the mixed and unstable character of its population.

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superiority of stature; according to the number of persons to the square mile; and according to average height. An inspection of the table shows that the first twelve states belong to the first three groups of concentration (2–45 per square mile). Leaving Vermont and New Hampshire out of view, the remaining nine states arrange themselves very regularly. Note that Ohio actually is No. 14, while by density it is No. 16; Delaware, No. 16, by density is No. 15; Pennsylvania, No. 17, by density is No. 18; and so on. Maryland, which was No. 13, is moved to No. 17. This partly results from the fact that Vermont is moved to the first column. Vermont and New Hampshire, having but 30 and 35 persons to the square mile, have relatively low statures, and would seem to be at variance with this generalization. Both are long settled states, and that in them the struggle for existence is extremely severe, and has modified the effect of density, is probable for several reasons. New Hampshire, in the years between 1860 and 1870, actually decreased in the number of its population. Vermont in the same period has gained only 2 persons per square mile. Massachusetts increased from 157 to 186 per square mile. Both Vermont and Massachusetts have a general average of 18–45 per square mile, showing agricultural pursuits. In 1870 the states having this average returned an agricultural product worth over $4,500 per square mile. In New Hampshire the total for the state was worth only $2,500–3,000 per square mile; and in Vermont, about $2,800–3,800. That is to say, the conditions of life in these two states are such that even this small population taxes the productive capacity of the soil very severely. This state of things must lead many able and vigorous young men to move west, to more fertile farms. The density considered in relation to the character of the environment, would, I think, lead us to expect that their position as regards stature would be low in the order. In the first column the transposition of Kentucky from the first to the tenth place is in part explainable by the very large proportion (three quarters) of the total number of men having enlisted from the less densely populated portions of the state; and the further fact that the American element is exceedingly large. Other seeming discrepancies could

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be explained, but lack of space forbids. I add a list of the statures in the different states, and also of the statures of portions of each state to show that where there is much concentration the stature is lowered by the density.

TABLE *Showing Number of Persons per Square Mile, Average Height, Order of Superiority by Stature, and Order of Superiority by Density of Population of the Different States.*

STATES.	No. of persons per square mile.	Average height.	Order of superiority by stature.	Order of superiority by density of population.
Kentucky	30	68.67	1	10
Kansas	2	68.55	2	1
Minnesota	2.10	68.37	3	3
Missouri	18	68.33	4	8
California	2	68.30	5	2
Indiana	89	68.08	6	12
West Virginia	19	68.00	7	9
Wisconsin	14	67.91	8	6
Maine	17	67.89	9	7
Iowa	12	67.89	10	4
Illinois	80	67.83	11	11
Michigan	13	67.82	12	5
Vermont	30	67.53	15	13
New Hampshire	35	66.92	21	14
Maryland	61	67 81	13	17
Ohio	58	67.78	14	16
Delaware	52	67.49	16	15
Pennsylvania	63	67.47	17	18
Rhode Island	133	67.29	18	22
New York	82	67.27	19	20
New Jersey	80	67.02	20	19
Massachusetts	157	66.89	22	23
Connecticut	96	66.58	23	21

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STATE.	Order of superiority.	Congresssional district.	Average height.	Number of men examined.	REMARKS.
Kentucky	1	1	69.47	490	
	9	5	67.84	398	Includes city of Louisville.
Missouri	1	4	70.08	103	Density 6–18 per sq. mile.
	7	7	68.08	1,572	Density 18–45 per sq. mile, over 10 per cent. foreign.
	9	1	67.52	1,189	Includes city of St. Louis.
Wisconsin....	1	6	68.42	2,937	
	6	1	67.04	1,391	Milwaukee, Racine and Kenosha counties. Most densely settled portion of the state.
Illinois.....	1	10	69.03	3,475	
	12	1	67.12	2,271	Includes city of Chicago.
	13	8	67.04	2,601	Springfield and adjacent counties; 40 per cent. foreign, mostly German.
Pennsylvania .	1	17	68.36	2,741	
	19	4	66.66	2,471	City of Philadelphia.
	20	2	66.58	1,206	City of Philadelphia.
	21	5	66.57	1,390	City of Philadelphia.
	22	10	66.46	1,070	Pottsville. Mostly German, Irish, etc. (miners).
	23	1	66.41	954	City of Philadelphia.
	24	3	66.32	696	City of Philadelphia.
New York....	1	31	68.40	3,875	
	27	10	66.31	1,705	Tarrytown. Density 90+ per sq. mile.
	28	9	65.99	347	New York city.
	29	21	65.97	464	Utica. Density 45–90 per sq. mile.
	30	15	65.88	474	Troy. Density 90+ per sq. mile.
	31	5	65.73	462	New York city.
	25	2	66.42	652	City of Brooklyn.
	26	3	66.34	1,137	City of Brooklyn.

The something, then, which Dr. Gould speaks of as causing greater stature in the western as compared with the eastern states, and which also causes the greater stature of Milwaukee, as com-

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pared with Boston school children, is the lower degree of density in the population of the western states.

I am very glad to be able to quote so high an authority as Dr. Beddoe in regard to the influence of density upon the dimensions of man.

"The physical differences between country folkand townfolk are, perhaps, the most important ones developed in my tables. * * * Observe the gradual elevation of stature of the militia-men as we proceed from natives of Newcastle to those of Gateshead and the other suburbs, and then to those of the small towns and villages. * * * Next observe the Sheffield returns; the genuine natives of that town will be seen to fall considerably short of their fellow-workmen born in the surrounding towns and villages, and these again very much below the general population of Yorkshire and the other adjacent counties. At Haworth the population of weavers is stunted in comparison with Yorkshiremen in general, but even among them the natives of towns fall below the natives of villages, so that the degredation of stature would appear to be gradual and progressive. * * * The Lancashire and Norfolk returns are insufficient, the Nottinghamshire and Staffordshire fuller and more decided, but all point in the same direction. * * * Finally, the London return, which certainly does not err by depreciation, is much below the average of England."

ON THE RATE OF GROWTH OF THE BODY AND THE LOWER EXTREMITIES.

Plate XII shows curves for the body and the lower extremities of boys and girls from four to nineteen years. The body height was obtained by measuring from the seat on which the individual sat to the top of the head; and the length of the lower extremities by subtracting this height from the total height. How nearly this coincides with the length of the extremities measured to the perineum I am unable to say in the absence of any data. I have already made some measurements, but too few to be of value, and I prefer to give the curves and tables for what they are worth, and to defer their discussion until I shall have completed the

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series of measurements I am now making. It is interesting to observe, however, that on the plate the length of the body of the girl is less than that of the boy until the tenth year, and thereafter greater until the sixteenth. In the lower extremities the curves are irregular. At nine years the extremities of the girls are longer, at eleven shorter, and at twelve again longer. At about fourteen years the line for the boys passes above, while the line for the girls during the years from fifteen to eighteen only rises two-fifths of an inch. Hence between fourteen and fifteen the length of the girl's lower extremities is nearly twenty-nine inches, and at eighteen just above twenty-nine inches. At the same age their length of body is nearly thirty-one inches, and at eighteen it is nearly thirty-three inches. In other words, after about the fourteenth to the fifteenth year the increase in height to the eighteenth year — two inches — is gained by the growth of the body, the limbs increasing but little after that age. While the lower extremities of the girls are increasing by two-fifths of an inch, the gain of the lower extremities of the boys from between the fourteenth and fifteenth up to the nineteenth year is nearly four inches; the growth of the body during the same period being over four inches. It would seem, then, that the superiority of stature of males over females is due to two factors: first, the arrest of the growth of the lower extremities in girls at about fourteen and a half years — boys experiencing no retardation in their rate of growth; second, to the falling off of the rate of growth in the bodies of girls at about the fifteenth year, and the termination of their growth at about the seventeenth year.

Table No. 15 shows yearly and half-yearly increments in height and weight for Milwaukee school children. How far the excess in growth during the six months from May 1 to November 1 is due to the release from school work for two months of that time I am unable to determine. As shown in Table 16, Wretlind found that in Gotheborg going to school impeded growth. During the three months of vacation the children increased about half as much as they did while in school during the remaining nine months of the

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year.[1] Whether the season of the year might not in part explain this rapid growth is questionable.

SUMMARY OF RESULTS.

I. The rate of growth in the two sexes is such that the boys are taller until the twelfth year, and heavier until the thirteenth; between thirteen and fifteen the girls are both taller and heavier; after the age of fifteen the boys excel the girls both in weight and in stature. Girls nearly cease to grow when about seventeen years of age.

II. Children of pure American[2] descent are taller than children of foreign-born parents; but when compared in weight with children of German parents are, on the whole, lighter. The greater height is largely due to difference in stock or race.

III. For the same reason children of American[3] parentage are taller than those of either German or Irish; and the Irish are taller than the Germans.

IV. School children in Milwaukee are taller than school children in Boston. The weight of boys in Milwaukee is greater than that of boys in Boston. Girls in Boston are very slightly heavier than girls here. The superiority in height is probably due to the less degree of density of population in Milwaukee as compared with Boston, the struggle for existence is not so severe, and the life here has fewer urban disadvantages than in that city.

V. The height of American-born men, as is shown by my tables, is apparently more modified by the conditions accompanying density than by all other influences, race excepted; urban life as compared with rural life tending toward a decrease of stature. The forces here referred to act at all ages from five years upward.

VI. The rate of growth of Germans is markedly modified by residence in this country through one generation. In inter-marriage between Americans and Germans the offspring seem to take the height of the taller parent.

[1] Dr. Minot's article, Op. cit. p. 81.

[2] Pure American; both *parents* and *grandparents* born in the United States.

[3] American; *parents* born in the United States.

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VII. The growth of the body and of the lower extremities takes place in such a way that the length of the body of the girl is less than that of the body of the boy until the tenth year, and thereafter greater until the sixteenth. From fifteen to eighteen the bodies of girls grow only two inches, and the bodies of boys over four. For the lower extremities, at nine years those of the girl are longer, at eleven shorter, and from twelve to fourteen again longer. At fourteen the lower extremities of the girls almost cease growing, while those of the boys increase by four inches between the ages of fourteen and nineteen.

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TABLE No. 15.—*Showing Yearly and Half-Yearly Increments in Height and Weight for Milwaukee School Children.*

AGE AT LAST BIRTHDAY.	BOYS.						GIRLS.					
	Yearly increment.			Half-yearly increment, from May 1 to Nov. 1, two months being vacation.			Yearly increment.			Half-yearly increment from May 1 to Nov. 1, two months being vacation.		
	No. of Obs.	Height, inches.	Weight, pounds.	No. of Obs.	Height, inches.	Weight, pounds.	No. of Obs.	Height, inches.	Weight, pounds.	No. of Obs.	Height, inches.	Weight, pounds.
Fourteen	217	2.42	10.87	15	1.52	11.56	229	1.82	9.68	8	.52	7.41
Fifteen	109	2.45	13.29	17	1.26	8.64	133	1.09	8.23	20	.19	8.14
Sixteen	58	2.73	13.01	12	.83	5.50	109	.57	4.71	33	.11	5.23
Seventeen	31	1.58	8.29	10	1.54	5 35	54	.75	2.74	17	.17	4.82
Eighteen	19	.84	7.41	3	.24	7.30	45	.62	.64	12	.20	3.25
Nineteen	7	1.24	7.78	.....	.....	.....	20	.73	.....	3	.10	5.70

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TABLE NO. 16.—*Showing Rate of Growth of Gotheborg School Boys During Vacation and Term-time. (Wretlind.)*

AGE.	No. of Observations.	Increments.	
		Three months vacation. Height in inches.	Nine months school. Height in inches.
Seven	121	2.62	8.40
Eight	239	3.72	8.40
Nine	368	4.42	8.95
Ten	452	5.54	9.90
Eleven	499	6.01	12.78
Twelve	483	7.85	16.04
Thirteen	506	10.85	13.09
Fourteen	487	10.27	15.69
Fifteen	299	10.14	8.87
Sixteen	159	7.15	7.88
Seventeen	84	7.06	2.20
	3,647		

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TABLE No. 1.— *Showing Average Heights and Weights of Milwaukee School Boys.*

AVERAGE HEIGHTS (without shoes).

AGE AT LAST BIRTHDAY.	PARENTAGE.													
	Pure American.		American.		American and German.		German.		One or both English.		Irish.		Irrespective of Nationality.	
	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.
Four.....	4	39.85	8	40.35	4	39.55	33	40.88	.....	.....	2	39.25	64	39.98
Five.....	15	42.96	42	42.60	24	42.26	136	42.13	9	41.86	6	41.76	269	42.28
Six.....	26	43.75	71	43.53	46	43.80	292	44.20	19	43.92	15	44.80	546	44.08
Seven.....	35	46.18	83	46.13	49	46.54	313	46.96	30	46.06	24	46.76	593	46.69
Eight.....	39	48.32	77	48.32	43	48.35	308	48.01	27	48.52	26	47.75	575	48.05
Nine.....	38	50.64	81	50.72	39	49.95	293	49.86	31	49.83	28	50.21	544	50.00
Ten.....	36	52.37	63	52.10	34	52.30	300	51.78	28	51.89	25	51.72	543	51.85
Eleven.....	41	55.26	63	54.41	40	53.63	297	53.57	28	53.82	13	54.42	519	53.76
Twelve.....	32	56.35	49	55 69	25	54.72	246	54.93	23	55.91	13	55.09	337	54.98
Thirteen	42	57.79	56	57.55	26	57.94	180	57.19	17	58.59	9	56.44	347	57.47
Fourteen.....	30	59.62	42	59.76	14	60.88	103	59.15	17	60.37	10	59.61	212	59.89
Fifteen.....	26	62.66	32	62.84			42	61.96	9	63.81	6	63.18	107	62.34
Sixteen	17	66.70	22	65.80	8	63.84	21	63.66	6	67.46	1	63.50	59	65.07
Seventeen	7	68.01	10	67.50			8	66.25	5	66.10	1	66.30	32	66 60
Eighteen. ..	4	70.05	6	69.08	.....	.....	7	65.45	.....	.....	2	68.40	19	67.44
Nineteen.....	3	69.10	3	69.10	.....	.....	3	68.20	.....	.....	.....	.....	7	68.68
Totals.....	395	.....	708	.....	352	.....	2,582	.....	249	.....	181	.....	4,778	.....

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TABLE No. 2.—*Showing Average Heights and Weights of Milwaukee School Boys.*

AVERAGE SITTING HEIGHTS.

AGE AT LAST BIRTHDAY.	PARENTAGE.													
	Pure American.		American.		American and German.		German.		One or both English.		Irish.		Irrespective of Nationality.	
	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.
Four	4	22.47	8	22.71	4	23.32	33	22.48	2	22.70	2	21.95	65	22.65
Five	15	23.87	42	23.75	24	23.67	135	23.53	8	23.36	6	23.28	264	23.53
Six	26	24.51	68	24.48	46	24.32	203	24.13	17	24.62	15	24.67	557	24.39
Seven	33	25.35	80	25.44	48	25 35	315	25.29	30	25.25	24	25.44	599	25.33
Eight	40	26.49	76	26.38	44	26.22	314	26.16	27	26.35	26	26.07	581	26.17
Nine	39	27.31	80	27.27	38	27.11	283	26.93	28	27.03	29	27.24	535	27.53
Ten	37	28.06	62	27.92	36	27.93	323	27.22	30	27.89	12	27.79	544	27.71
Eleven	39	29.18	61	28.86	42	28.36	299	28.03	27	28.44	13	28 44	522	28.55
Twelve	33	29.79	49	29.49	27	28.73	249	28.96	23	28.96	14	29.21	436	29.01
Thirteen	41	30.11	54	30.05	26	30.16	180	29.83	16	30.48	9	29.50	349	29.97
Fourteen	30	31.20	42	31.17	14	31.71	99	30.86	16	31.54	10	31.13	210	31.13
Fifteen	26	32.81	33	32.88	8	31.80	42	32.10	9	34.46	5	33.32	108	32.58
Sixteen	16	34.77	22	34.40	2	32.55	23	33.25	7	35.27	5	34.46	59	34.00
Seventeen	7	35.41	9	35.08	2	35.25	8	34.70	5	35.50	3	3,536	32	34.78
Eighteen	6	35.03	6	35.03	.....	.....	7	34.90	.....	.....	.....		.....	35.37
Nineteen	3	35.73	3	35.73	.....	.....	3	36.27	.....	.....	.....	.....	26	
Totals	397	.....	695	.....	351	.....	2,606	.....	245	.....	173	.....	4,887	.....

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TABLE No. 8.—*Showing Average Heights and Weights of Milwaukee School Boys.*

AVERAGE WEIGHTS (in ordinary dress).

AGE AT LAST BIRTHDAY.	PARENTAGE.													
	Pure American.		American.		American and German.		German.		One or both English.		Irish.		Irrespective of Nationality.	
	No. of Obs.	Pounds.	No. of Obs.	Pounds.	No. of Obs.	Pounds.	No. of Obs.	Pounds.	No. of Obs.	Pounds.	No. of Obs.	Pounds.	No. of Obs.	Pounds
Four	4	38.31	8	39.22	3	39.75	34	38.64	2	38.25	2	37.75	66	38.84
Five	16	42.80	44	41.69	23	41.08	162	41.55	8	40.97	7	40.86	296	41.09
Six	25	45.20	70	44.88	46	44.57	328	45.24	17	42.44	15	46.15	595	44.81
Seven	34	48.13	81	48.73	46	49.59	344	49.17	29	48.46	24	49.39	646	49.10
Eight	41	54.51	80	54.79	45	54.67	342	53.98	27	53.97	26	53.62	585	53.81
Nine	40	60.33	84	60.93	41	59.15	316	58.80	31	61.05	29	59.36	587	59.46
Ten	38	65.42	66	65.14	35	66.36	340	64.84	29	64.53	12	67.69	558	65.35
Eleven	37	74.28	93	72.29	43	70.53	313	70.81	28	72.29	14	71.50	543	70.92
Twelve	33	80.53	51	77.08	26	73.54	251	75.72	23	76.68	15	78.85	439	76.08
Thirteen	43	85.56	53	84.74	25	89 23	184	84.36	17	86.82	10	79.43	351	84.89
Fourteen	29	93.90	39	95.64	16	100 25	105	94.88	15	92 93	10	94.73	217	95.76
Fifteen	28	106.26	34	109.43	3	97.83	41	109.10	8	121.63	5	110.40	109	109.05
Sixteen	16	124.69	21	122.05	2	107.75	23	118.88	7	136 21	1	113.75	58	122.06
Seventeen	7	129.71	10	127.53	1	136.75	7	132.25	4	139.63	1	124.00	31	130.35
Eighteen	4	127.25	6	130.79	1	115.50	7	136.46	.....	.....	2	151.25	19	137.76
Nineteen	3	142.50	3	142.50	.....	.....	3	151.58	.....	.....	.....	.....	7	145.54
Totals	398	.....	743	.....	356	.....	2,800	.....	245	.....	173	.....	5,107	.....

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TABLE No. 4.— *Showing Average Heights and Weights of Milwaukee School Girls.*

AVERAGE HEIGHTS (without shoes).

AGE AT LAST BIRTHDAY.	PARENTAGE.													
	Pure American.		American.		American and German.		German.		One or both English.		Irish.		Irrespective of Nationality.	
	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.
Four	3	39.90	7	38.70	4	40.28	31	38.70	3	38.67	.....	.....	71	39.65
Five	16	41.72	33	40.66	17	42.09	174	40.54	11	42.75	10	41.78	231	41.72
Six	11	43.51	43	43.45	44	44.03	307	43.42	17	44.72	16	43.99	508	43.78
Seven	29	45.76	65	45.87	37	45.29	302	45.86	31	46.04	23	46.53	549	45.93
Eight	39	48.36	76	47.40	37	48.36	323	47.39	24	47.25	20	47.06	553	47.59
Nine	40	49.87	78	49.81	46	50.24	310	49.76	31	50.37	30	50.86	578	49.81
Ten	38	52.08	56	51.79	34	51.91	286	51.84	20	52.65	30	52 13	526	51.89
Eleven	50	55.15	65	54.40	33	53.98	270	53.46	25	54.82	24	54.26	507	53.80
Twelve	44	57.08	72	57.07	25	56.82	242	55.83	33	56.99	21	56.52	469	56.47
Thirteen	47	59.46	68	59.18	17	58.64	146	58.22	31	59.50	24	58.99	327	58.68
Fourteen	40	60.92	53	61.03	11	60.65	78	59.95	24	60.71	21	60.63	219	60.50
Fifteen	33	62.01	39	61.81	.....	.....	39	61.15	14	61.54	17	61.81	128	61.59
Sixteen	25	62.10	37	61.99	.....	.....	23	61.97	8	62.07	13	62.86	108	62.16
Seventeen	17	62.65	21	62.58	.....	.....	13	62.75	5	62.76	7	64.54	52	62.91
Eighteen	20	62.66	21	62.90	.....	.....	.....	.....	6	63.08	.....	.....	45	62.53
Nineteen	20	63.25	21	63.11	.....	.....	.....	.....	4	62.33	.....	.....	20	63.26
Totals	472	.....	755	.....	805	.....	2,544	.....	287	.....	256	.....	4,891	.....

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TABLE No. 5.— *Showing Average Weights and Heights of Milwaukee School Girls.*

AVERAGE SITTING HEIGHTS.

AGE AT LAST BIRTHDAY.	PARENTAGE.													
	Pure American.		American.		American and German.		German.		One or both English.		Irish.		Irrespective of Nationality.	
	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches.	No. of Obs.	Inches	No. of Obs.	Inches.
Four	8	22.70	7	22.23	4	23.37	30	22.14	8	22.37	4	21.20	71	22.18
Five	16	23.29	34	23.33	18	23.24	122	23.18	12	23.66	10	23.20	230	23.21
Six	11	24.29	44	24.28	48	24.43	296	24.27	17	24.80	16	24.49	502	24.29
Seven	29	25.30	68	25.24	34	24.86	301	25.15	31	25.14	24	25.66	549	25.21
Eight	38	26.52	77	26.29	37	26.31	320	25.80	25	25.61	20	25.64	544	25.87
Nine	40	26.74	77	26.81	48	27.09	318	26.74	31	26.99	29	27.20	576	26.81
Ten	38	27.90	57	27.75	34	27.58	284	27.64	20	28.06	31	28.03	514	27.71
Eleven	50	29.40	65	29.10	30	28.46	270	28.71	25	29.13	24	28.78	494	28.62
Twelve	43	30.15	70	30.36	25	30.08	244	29.40	33	29.94	20	29.53	466	29 59
Thirteen	47	31.44	67	31.31	19	31.01	145	30.66	30	31.70	24	31.48	329	30.99
Fourteen	40	32.19	52	32.18	12	32.52	78	31.74	22	32.13	22	32.28	218	31.83
Fifteen	33	33 00	39	33.02	3	33.47	88	32.39	14	33.08	17	33.08	130	32.88
Sixteen	26	33.17	36	33.18	.....	.....	23	33.20	8	33.56	13	33.73	106	33.35
Seventeen	17	33.70	22	33.78	.....	.....	13	33.72	5	34.00	8	34.55	54	33.89
Eighteen	19	33 81	23	33.73	.....	.....	4	33.15	6	33.88	4	33.35	45	33.67
Nineteen	2	33.88	11	34.19	.....	.....	3	33.33	4	33.43	.....	.....	20	33.88
Totals	452	.....	749	.....	312	.....	2,484	.....	286	.....	266	.....	4,848	.....

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TABLE No. 6.—*Showing Average Heights and Weights of Milwaukee School Girls.*

AVERAGE WEIGHTS (in ordinary dress).

AGE AT LAST BIRTHDAY.	PARENTAGE.													
	Pure American.		American.		American and German.		German.		One or both English.		Irish.		Irrespective of Nationality.	
	No. of Obs.	Pounds.	No. of Obs.	Pounds.	No. of Obs.	Pounds.	No. of Obs.	Pounds.	No. of Obs.	Pounds.	No. of Obs.	Pounds.	No. of Obs.	Pounds
Four	3	37.67	8	36 38	4	38.50	38	36 49	3	36.75	4	33.56	80	36 29
Five	15	39.55	34	39.44	19	39.19	141	40.50	12	40.48	11	39.16	253	40.03
Six	11	42.45	44	42.50	46	43.92	308	43.23	17	44.99	17	42.88	525	43.12
Seven	38	46.74	69	46.53	41	46 51	326	46.94	33	47.05	23	48.39	591	46 97
Eight	39	52.81	79	51.80	41	52.61	322	50.83	28	49.81	21	49.69	595	50.87
Nine	41	56.35	82	55.67	49	59.00	335	55 52	31	56.67	31	59.94	621	56.44
Ten	40	61.70	61	61.77	37	61.98	312	62.82	22	67.68	31	63.13	554	62.45
Eleven	50	71.73	65	70.83	32	69.57	281	68.19	27	71.28	24	69.02	514	68.84
Twelve	43	82.98	72	82.17	28	80.24	240	75 36	33	79.99	22	78.68	478	77.82
Thirteen	47	91.62	66	89.64	21	88 14	145	86.64	31	92.18	25	88.56	336	87.96
Fourteen	46	96.36	58	98.84	11	99.27	75	95.30	24	96.58	22	96.32	229	97.64
Fifteen	33	105.90	40	104.71	3	128 58	40	105.66	15	103.60	17	105.09	132	105.87
Sixteen	26	107.21	37	106.74	2	109.25	23	112.54	8	104.19	13	119.96	109	110.58
Seventeen	17	115.06	22	114.60	.....	.....	13	120.40	5	111.95	8	114.47	54	113.32
Eighteen	20	116.74	23	115.68	.....	.....	4	107.88	6	117.00	4	114.56	45	113.48
Nineteen	9	121.61	11	119.93	.....	.....	3	109.75	4	113.19	.....	.....	20	117.30
Totals	478	.....	771	.....	334	.....	2,606	.....	299	.....	273	.....	5,130	.....

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TABLE No. 7.— *Showing Annual Growth and Ratio of Weight to Height of Milwaukee School Children.*

BOYS.

AGE.	PARENTAGE.																							
	Pure American.			American.			American and German.			German.			One or both English.			Irish.			Irrespective of Nationality.		
	Annual increase.		Pounds per inch.	Annual increase.		Pounds per inch.	Annual increase.		Pounds per inch.	Annual increase.		Pounds per inch.	Annual increase.		Pounds per inch.	Annual increase.		Pounds per inch.	Annual increase.		Pounds per inch.
	Height, inches.	Weight, pounds.		Height, inches.	Weight, pounds.		Height, inches.	Weight, pounds.		Height, inches.	Weight, pounds.		Height, inches.	Weight, pounds.		Height, inches.	Weight, pounds.		Height, inches.	Weight, pounds.	
Four.....	.....	.....	.963	.....	.....	.971	.....	.....	1.005	.....	.....	.945	...	.....	.....	.....	.....	.961	.....	.....	.971
Five	3.11	3.99	.984	2.25	2.47	.978	2.71	1.33	.972	1.25	2.91	.986	....	2.72	.978	3.51	3.11	.978	2.30	2.25	.971
Six.....	.79	2.90	1.033	.93	3.19	1.031	1.54	3.49	1.017	2.07	3.69	1.023	2.06	1.47	.966	3.04	5.29	1.030	1.80	3.73	1.076
Seven	2.43	2.93	1.422	2.60	3.85	1.056	2.74	5.02	1.065	1.86	3.93	1.067	2.14	6.02	1.051	1.96	3.24	1.056	2.01	4.29	1.065
Eight	2.14	6.38	1.128	1.19	6.06	1.133	1.81	5.08	1.130	1.95	4.81	1.124	2.46	5.51	1.112	.99	4.23	1.122	1.96	4.71	1.119
Nine.....	2.32	5.82	1.191	2.40	6.14	1.201	1.60	4.48	1.184	1.85	4.82	1.179	1.31	7.08	1.225	2.46	5.74	1.182	1.18	5.65	1.189
Ten	1.73	5.09	1.249	1.38	4.21	1.250	2.35	7.31	1.268	1.92	6.04	1.252	2.06	3.48	1.243	1.51	8.33	1.308	1.85	5.89	1.260
Eleven ...	2.89	8.86	1.344	2.31	7.15	1.328	1.33	4.17	1.315	1.89	5.97	1.321	1.93	7.76	1.343	2.70	3.81	1.318	1.91	5.57	1.319
Twelve...	1.09	6.25	1.429	1.28	4.79	1.384	1.09	3.01	1.343	1.36	4.91	1.379	2.09	4.39	1.371	.67	7.35	1.431	1.22	5.16	1.383
Thirteen..	1.44	5.03	1.480	1.86	7.66	1.472	3.22	15.69	1.540	2.26	8.64	1.475	2.68	10.14	1.481	1.35	.58	1.407	2.49	8.81	1.477
Fourteen .	1.83	8.84	1.500	2.21	1.090	1.600	2.94	11.02	1.652	1.96	10.52	1.604	1.78	6.16	1.510	3.17	15.30	1.589	2.42	10.87	1.598
Fifteen...	3.04	1.236	1.695	3.08	1.379	1.742	{ 2.96	{	.....	2.81	14.22	1.762	3.44	28.65	1 906	3.57	15.67	1.747	2.45	13.29	1.749
Sixteen...	4.04	1.843	1.854	2.96	1.262	1.854			.....	1.70	9.78	1.867	3.65	14.58	2.019	.32	3.35	1.791	2.73	13.01	1.875
Seventeen.	1.31	5.02	1.907	1.70	5.48	1.880		8.50	.....	2.59	13.37	1.996	....	3.42	2.121	2.80	10.25	1.870	1.53	8.29	1.957
Eighteen .	{ 1.65	4.07	1.816	1.58	3.26	1.893	.....		.....	{ .02	4.21	2.084	....	.....	.....	2.10	27.25	2.211	.84	7.41	2.042
Nineteen .			2.062	.02	1.171	2.062	.....		.....		15.12	2.222	....	.....	.....	...	.....	.....	1.24	7.78	2.119

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TABLE No. 8.—*Showing Annual Growth and Ratio of Weight to Height of Milwaukee School Children.*

GIRLS.

AGE.	PARENTAGE.																							
	Pure American.			American.			American and German.			German.			One or both English.			Irish.			Irrespective of Nationality.					
	Annual increase.		Pounds per inch.	Annual increase.		Pounds per inch.	Annual increase.		Pounds per inch.	Annual increase.		Pounds per inch.	Annual increase.		Pounds per inch.	Annual increase.		Pounds per inch.	Annual increase.		Pounds per inch.			
	Height, inches.	Weight, pounds.		Height, inches.	Weight, pounds.		Height, inches.	Weight, pounds.		Height, inches.	Weight, pounds.		Height, inches.	Weight, pounds.		Height, inches.	Weight, pounds.		Height, inches.	Weight, pounds.				
Four	...	.....	.944	...	.....	.940	...	.....	.943	....	.....	.942	...	.....	.950	...	.....	.....	....	.....	.915			
Five	1.82	2.88	.947	2.96	3.06	.969	1.81	1.19	.931	1.84	4.01	.999	4.08	3.73	.946	2.21	5.60	.937	2.07	3.74	.959			
Six	1.79	2.90	.975	2.79	3.06	.978	1.94	4.73	.997	2.88	2.73	.995	1.97	4.51	1.006	2.54	3.72	.974	2 06	3.09	.987			
Seven	2.25	4.29	1.021	2.42	4.03	1.014	1.26	2.59	1.026	2.44	3.71	1.023	1.32	2.06	1.021	.58	5.51	1.039	2 15	3.85	1.026			
Eight	2.60	6.07	1.091	1.58	5.27	1.092	3.05	6.10	1.087	1.53	3.89	1.072	1.21	2.76	1.054	3.80	1.80	1.055	1.66	3.90	1.068			
Nine	1.51	3.54	1.129	2.41	3.87	1.117	1.98	6.39	1.134	2.37	4.69	1.115	3.12	6.86	1.125	1.27	10.25	1.178	2.22	5.57	1.133			
Ten	2.21	5.35	1.184	1.98	6.10	1.192	1.67	2.98	1.193	2.08	7.30	1.211	2.28	11.01	1.285	2.13	3.19	1.211	2.08	6.01	1.203			
Eleven	3 07	10.03	1 300	2.61	9.06	1.302	2.07	7.59	1.288	1.62	5.37	1.273	2.17	3.60	1.300	2.26	5.89	1.273	1.91	6.39	1.279			
Twelve	1.93	11.25	1.453	2.67	11.84	1.439	2.84	10.67	1.412	2.37	7.17	1.354	2.17	8.71	1.403	2.47	9.66	1.392	2.67	8.98	1.378			
Thirteen	2.38	8.64	1.540	2.11	7.47	1.514	1.82	7.90	1.503	2.39	11.28	1.488	2.51	12.09	1.547	1.64	9.88	1.501	2.21	10.14	1.49.			
Fourteen	1.46	4.44	1.576	1.85	9.20	1.619	2.01	11.13	1.636	1.73	8.66	1.590	1.21	4.50	1.590	1.18	7.76	1.593	1.82	9.68	1.613			
Fifteen	1.19	8.84	1.707	.78	5.87	1.694	....	29.31	.....	1.20	10.36	1.727	.83	7.02	1.683	1.05	8.77	1.700	1.09	8.28	1.718			
Sixteen	.09	1.31	1.726	.18	2.03	1.721	...	.....	.....	.82	6.88	1.816	.53	.59	1.678	1.68	14 87	1.919	.57	4.71	1.778			
Seventeen	.55	7.85	1.836	.59	7.86	1.831	....	.....	.....	.78	}	1.918	.69	7.76	1.783	...	.....	1.773	.75	2.74	1.801			
Eighteen	.01	1.68	1.863	.32	1.08	1.839	....	....	.....	....	} 3.75	.....	.32	5.05	1.854	...	.....	.....	.62	} .64	1.798			
Nineteen	.59	4.87	1.922	.21	4.25	1.900	...	....	.....	....	}	.....	....	.....	1.815	....	.....	.....	.78	}	1.854			

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APPENDIX.

Since writing this report I have received through the courtesy of Dr. L. B. Tuckerman, of Cleveland, Ohio, the dates of first menstruation of eighty-two girls, as follows:

Between 10 and 11 years of age	2
Between 11 and 12 years of age	2
Between 12 and 13 years of age	6
Between 13 and 14 years of age	22
Between 14 and 15 years of age	25
Between 15 and 16 years of age	20
Between 16 and 17 years of age	4
Between 17 and 18 years of age	1
Total	82

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TOBACCO AND ITS EFFECTS.

BY G. F. WITTER, M. D., OF GRAND RAPIDS, WIS.

In this age it becomes more and more the aim of the sanitarian to search out the avoidable causes of sickness, and to admonish the people to order their lives in accordance with Nature's laws, and thus avoid many evils that otherwise they must endure. The medical profession has had much to do in relieving the suffering in the world that has been due to accident or indiscretion, but it has not not hitherto taken that interest in discovering and endeavoring to remove the causes of ill-health which will be the foundation of a large part of the medical science of the immediate future.

It is not difficult to see that there are at present many vast and wholly unexplored fields in the province of preventive medicine. Public hygiene is yet in its infancy. Certain forces are at work producing illness, and a huge amount of drugs is used to counteract the evil tendencies thus engendered, while no sufficient attention is given to the causes that have occasioned the sickness, the removal of which would restore health with little or no medicine. We study fully the symptoms and effects of disease, but we have not as yet investigated its sources with anything like the same thoroughness. The communicable diseases, as Scarlet Fever, Measles, Diphtheria, Yellow Fever, etc., we know by their manifestations; but no one has yet made us fully acquainted with the methods by which they invade the human system. Some may have undertaken to explain their mysteries, but nothing more has been accomplished than to show how the body may at times be prepared for the invasions of disease, as the ground is prepared by plowing and harrowing for the reception of the seed. We do not yet know whether a given disease is developed from germs, from invisible and indefinable miasma, or through tendencies inherent in the individual, or whether it is partly or wholly due to long-continued habits of abuse.

Impressed with the ideas that a very large proportion of the suf-

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fering in the world has been brought about by ignorance, not only among the wholly uneducated, but also among those possessing — or at any rate claiming the possession of a higher degree of cultivation, a larger amount of knowledge, and that many diseases, the origin of which is regarded as obscure and mysterious, are really often due to the bad habits of the individual, we propose in the following pages to discuss the effects of one habit which we consider a bad one, i. e., the use of tobacco and its influence on health.

It is well known that tobacco is used in every conceivable dose, from the most heroic to the infinitesimal; in every nation and in all ranks of society its way is established; the gray-haired patriarch is not too old, nor is the boy of ten too young to be its willing subject; alike in the filthiest slums and byways and in the promenades and avenues where the highest fashion and the most polite society are found, it is present. It sits in our legislative halls, both state and national; it travels by every conveyance on land and water. The offices of the lawyer and physician and the sanctum of the clergyman are alike under its cloud. The coarse and blustering and the elegant, refined and scholarly are equally its victims. Tobacco's insidious spell has fallen upon the world, and the pipe, the cigar and the snuff-box are a common solace among all ranks and conditions of men.

"One of the most remarkable circumstances connected with the history of tobacco is the rapidity with which its growth has spread and its consumption increased." The enormous extent to which its use has attained in Great Britain and other countries is briefly shown in the following figures:

In Great Britain the total consumption has been:

In 1857	32,856,913 lbs.
In 1867	40,720,767 lbs.
In 1875	49,951,830 lbs.
In 1880	50,000,000 lbs.
In France, the amount entered for consumption in 1880 was	45,000,000 lbs.
In Austria, during the same year	81,000,000 lbs.
In Russia, during the same year	25,000,000 lbs.

The extent to which its use has increased in our own country

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may be judged with tolerable accuracy by a comparison of the census returns given herewith, which show the tobacco production of the states and territories for the census years 1870 and 1880, the increase being 210,372,232 lbs. during the decade, or rather more than 80 per cent. These figures become more significant when it is known that the crop of 1880 was only a medium crop, and not at all in excess of the present requirements for home consumption and exportation.

"Fifteen states produce now, as in 1870, more than 90 per cent. of the tobacco of the United States; of these fifteen, only Missouri, Illinois, Indiana and Massachusetts produce less than in 1870. Kentucky occupies the first position, producing thirty-six per cent. of the total amount; Virginia holds the second place, raising 80,099,838 lbs. against 60,000 lbs. in 1862; Pennsylvania has advanced from the twelfth place to the third, Wisconsin from the fifteenth to the tenth, and North Carolina, Connecticut and New York have each gained one point, making North Carolina sixth, Connecticut eighth, and New York twelfth in the rank of tobacco states. The changes of the decade may appear more clearly in the following statement:

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Tobacco and its Effects.

A COMPARATIVE STATEMENT, SHOWING THE TOBACCO PRODUCT OF THE STATES AND TERRITORIES FOR THE CENSUS YEARS 1880 AND 1870, WITH THE ACREAGE OF 1880.

STATES AND TERRITORIES.	1880.		1870.
	Acreage.	Pounds.	Pounds.
Total	637,659	473,107,573	262,735,341
Alabama	2,198	452,556	152,742
Arizona	1	600	100
Arkansas	2,064	970,220	594,886
California	84	73,317	63,809
Colorado			890
Connecticut	8,666	14,044,652	8,328,798
Dakota	7	2,107	
Delaware	5	1,353	250
District of Columbia	2	1,400	
Florida	102	22,197	157,405
Georgia	1,057	231,198	288,596
Idaho	2	400	
Illinois	5,625	3,936,700	5,249,274
Indiana	11,955	8,872,842	9,825,392
Iowa	694	420,722	71,792
Kansas	334	191,749	33,241
Kentucky	226,127	171,121,134	105,305,869
Louisiana	264	56,564	15,541
Maine	3	350	15
Maryland	38,174	26,082,147	15,785,339
Massachusetts	3,358	5,369,436	7,312,885
Michigan	173	84,333	5,385
Minnesota	167	70,389	8,247
Mississippi	1,475	415,248	61,012
Missouri	15,500	11,994,077	12,320,483
Montana			600
Nebraska	106	58,589	5,988
Nevada	2	1,500	25
New Hampshire	88	170,843	155,334
New Jersey	154	171,405	40,871
New Mexico	10	1,249	8,587
New York	4,938	6,553,351	2,349,798
North Carolina	57,215	26,986,448	11,150,087
Ohio	84,679	34,725,405	18,741,973
Oregon	46	17,860	3,847
Pennsylvania	27,567	36,957,772	3,467,539
Rhode Island	3	925	796
South Carolina	183	46,144	34,805
Tennessee	41,532	29,365,052	21,465,452
Texas	702	223,398	59,706
Utah			
Vermont	83	131,422	72,671
Virginia	139,423	80,099,838	37,086,364
Washington Territory	9	7,073	1,682
West Virginia	4,071	2,296,146	2,046,452
Wisconsin	8,811	10,878,463	960,813
Wyoming			

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Tobacco and its Effects.

Thus it will be seen that the amount of money expended and changing hands for tobacco, in this country alone, is enormous; allowing ten cents per pound for the raw material in 1880, it reached the sum of $47,310,757.30, and this only on the first change from the producer's into the manufacturer's hands, to say nothing of the added value given to it in the factory, and the added cost due to the revenue tax. What more effectual argument can be made by the economist than the simple presentation of these figures? The official returns show that in Germany, Spain, Holland, Great Britain and the United States *tobacco costs more than bread.* "A single firm in New York paid to the government *in one month* in 1880, a revenue tax of $120,000! The average monthly tax paid by this house for Internal Revenue is over $100,000. The shipment of snuff by this concern to one city in North Carolina amounts to one hundred pounds per month." We learn from the Internal Revenue Reports that more than ninety-five million pounds of manufactured tobacco, and one billion, three hundred millions of cigars are used in the United States every year, at an expense of two hundred and fifty millions of dollars, while the revenue tax amounts to one hundred and fifty millions of dollars. In the city of New York alone, about seventy-five millions of cigars are annually consumed at a cost of more than nine millions of dollars.

Now we do not assume that this outlay is wrong because it is so enormous. There is said to be no better use for money as a general thing than to "spend it as one goes along." This, however, is a question of spending money to the best advantage; there ought to be no doubt in regard to the character of any personal indulgence which draws so largely upon the resources, usually moderate in American homes, on which the whole family depends, from which must come whatever its members have of education, recreation, etc., in short all that gives form and tone to character; and more than this, "No man is so rich that he has a right to spend money to his own, or his fellow's undoing."

If, moreover, it shall become apparent on analysis that there is an actual food value to tobacco, or if it prove a health producing agency, or even a valuable luxury, the enormous tax above referred

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to will not appear so appalling. And this suggests a reference to the chemical constitution of tobacco.

The constituents which chiefly give tobacco its peculiar characteristics are, an alkaloid called Nicotina, a substance called Nicotianin or Tobacco Camphor, of which little is known (but concerning which it has been noted that upon the greater or less proportion of it depends the estimation in which a given sample of tobacco is held, the choicest tobaccos containing the largest percentage), and an empyreumatic oil of complex constitution. The alkaloid, Nicotina, has the odor of tobacco, and possesses very poisonous qualities; in this respect it is equal to prussic acid, a single drop being sufficient to kill a dog. "Its vapor is so irritating that it is difficult to breathe in a room where a single drop has been vaporized." Nicotina taken internally in very minute quantity produces great muscular depression, occasionally convulsions, and at last paralysis and death. The proportion of this substance contained in the dry leaf of tobacco varies from two to seven per cent. Besides these two volatile substances existing in the leaf ready formed, there is another of an oily nature produced when the tobacco is distilled alone in a retort, and to a certain extent also when it is burned in a pipe; it is acrid and disagreeable in taste, and has narcotic and poisonous properties. One drop applied to the tongue of a cat caused convulsions followed by death in ten minutes.

There are various adulterations of tobacco, especially in countries where high duties hold out a temptation to fraud. The leaves of other plants dried and flavored with tobacco extract are frequently found in manufactured tobacco; paper and hay are sometimes used, but the more common adulterants are said to be the leaves of rhubarb, dock, burdock, cabbage, etc. "It is not surprising, therefore, to meet with manufactured tobaccos possessing a thousand different flavors for which the chemistry of the leaf can in no way account."

"Extensively as tobacco is used, it is remarkable how very few persons can state distinctly the effects which it produces upon them; why they began and for what reason they continue the indulgence.

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Tobacco and its Effects.

If the reader be a user of tobacco, let him ask himself these questions, and he will probably be surprised to note how little satisfactory the answers he receives will be. Indeed, few have cared to analyze their sensations while under its influence, or if they have analyzed them have cared to tell truly what kind of enjoyment it is which they seek in its use."

Turning to another branch of the subject and examining more fully the physiological effects of tobacco, we find that physiologists are not agreed in regard to the peculiar mode of its action. The nerves are considered by some as being probably the principal medium, but the cases on record where death has been produced by the application of small quantities to wounds would indicate that the process is more complex. The whole subject of the physiological action of tobacco is so complicated that but little is really known concerning it; there is, it is said, a remarkable difference between the action of the alkaloid and the essential oil, the one of which possesses the power of paralyzing the heart's action, while the other has no such property. Given to a person in ordinarily good health but unaccustomed to its use, tobacco either chewed or smoked, causes distressing sickness at the stomach, fullness at the head, and frequently ringing in the ears and giddiness, relaxation of the bowels, partial paralysis of the sphincter muscles, especially those of the large intestine, and other equally serious effects. These conditions are not all met with in each case, but a sufficient number is always present to startle any one who sees them for the first time.

Persons of a nervous temperament have found it impossible for a long time after beginning the use of tobacco to indulge in it without experiencing decidedly unpleasant sensations. Dr. Pereira says that "In small doses tobacco causes a sensation of heat in the throat, and sometimes a feeling of warmth in the stomach. These effects are less obvious when the agent is taken in liquid form and largely diluted. By repetition it usually acts as a diuretic, and less frequently as a laxative. Accompanying these effects are often nausea and a peculiar feeling usually described as giddiness, scarcely according, however, with the ordinary acceptation of that

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term. In larger doses it produces nausea, vomiting and purging; though it seldom gives rise to abdominal pain, it produces a most distressing sensation of uneasiness at the pit of the stomach. It occasionally acts as an anodyne, or more rarely promotes sleep. But its most remarkable effects are languor, fullness, relaxation of the muscles, trembling of the limbs, great anxiety and tendency to faint. Vision is frequently obscured; the ideas are confused, and the pulse is small and weak; respiration is somewhat laborious; the surface is cold and clammy, or covered with a cold sweat, and in extreme cases, convulsive movements are observed. In excessive doses the effects are of the same kind, but more violent in degree. The more prominent symptoms in addition to those already noted are extreme weakness and relaxation, depression of the vascular system (manifested by feeble pulse, pallor, cold sweat and tendency to faint), convulsive movements followed by paralysis, and a kind of torpor sometimes terminating in death."

One would suppose that a substance producing such effects as those just described at the beginning of its use would be very soon abandoned. "Nothing, however, with mankind appears so attractive as a habit surrounded by all the attributes which lift it into the dignity of a fashion."

The enormous consumption of tobacco in our country heretofore mentioned has been ascertained from the yearly returns of the revenue officers, but the physical, mental and moral deterioration resulting therefrom admit of no such tangible analysis. These, although sure, are slow and imperceptible in their development, and it is therefore impossible to estimate the amount of the injury which tobacco thus inflicts upon the public welfare. We cannot do better in this connection than quote the remarks of Dr. B. W. Richardson, an eminent practitioner, whose researches are taken by Chambers as the basis of his treatise on tobacco. Richardson declares "that in the confirmed smoker there is a constant functional disturbance which extends to the blood, the stomach, the heart, the lungs, the brain and the nerves." That does not leave much of the man except his hair and his bones. He says further that "the use of tobacco gives a doubtful pleasure for a certain

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penalty; that so long as the practice is continued the smoker is out of health; his stomach only partly digests; his heart labors unnaturally; his blood is not fully oxygenized."

Dr. Hassall says: "Tobacco owes its chief properties to the presence of two principles, both of which give the worst possible effects upon the human system, when taken pure." Both of these active principles have been shown by Zeise and Milsens to be present in the smoke of tobacco; they are therefore not destroyed by the combustion of tobacco, whether in the form of cigars or when used in a pipe. They are inhaled in the act of smoking and thus are taken into the lungs and stomach; especially is this the case when the saliva, impregnated with smoke, is swallowed. That these active constituents are actually absorbed and make their way into the system is further proved by the sickness, giddiness and death-like faintness experienced by those unaccustomed to smoking; the difference in the effects in the case of habitual smokers being caused by the fact that the system becomes inured to the use of tobacco, and therefore grows less susceptible to its influence.

Dr. Prout says: "Tobacco disorders the assimilative functions in general, but particularly, as I believe, the assimilation of the saccharine principles. I have never been able, indeed, to trace the development of Oxalic Acid to the use of tobacco, but that some analogous and equally poisonous principle is generated in certain individuals by its abuse is evident from their cachectic looks, and from the dark, and often greenish yellow tint of the blood. That severe and peculiar dyspeptic symptoms are sometimes produced by inveterate snuff-taking is known, and I have more than once seen such cases terminate fatally, with malignant disease of the stomach and liver. Great smokers, also, especially those who use short pipes and cigars, are said to be liable to cancerous affections of the lips. But it happens with tobacco as with deleterious articles of diet: the strong and healthy suffer comparatively little, while the weak and predisposed to disease fall victims to its poisonous operation. Surely if the dictates of reason were allowed to prevail, an article so injurious to health and so offensive in all its forms and modes of employment, must speedily be banished from common use."

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Tobacco and its Effects.

Sir Benjamin Brodie, in his Physiological Researches, published in 1854, says: "We may conclude that the empyreumatic oil of tobacco occasions death by destroying the functions of the brain without directly acting on the circulation. In other words, its effects are similar to those of alcohol, the juice of aconite and the essential oil of almonds." This testimony might be greatly increased were it necessary or desirable to add to it.

On the other hand, the advocates and friends of tobacco consider it a harmless luxury, and hold that "it sooths irritated nerves, clears and sharpens the exhausted intellect, fills an indefinable vacancy, produces a satisfied and calm condition of the mind, dispels loneliness, relieves weariness, and induces repose." They assert that its bad effects are only transient, that no organic lesions are ever to be observed which can be certainly traced to its use. In answer to all of which, Dr. T. F. Rumbold says: "It is seen that the system must be in a more or less vigorous condition to allow of the use of tobacco, plainly proving that it is a depressor of the nervous system; it as plainly follows that it is while the depression process is going on that the pleasurable feeling is experieneed." It does not soothe the nerves until by its primary effects it has first irritated them; it would of course be absurd to say that it sooths unirritated nerves. It cannot clear and sharpen the exhausted intellect until it has first beclouded and dulled the intellect. It cannot fill an indefinable vacancy until it has caused this vacancy. It cannot induce a calm and satisfied condition of the mind except it has first induced a restless and unsatisfied condition, nor can it induce repose until it has caused sleeplessness. Will the lad who has just smoked his first pipe or cigar say that it has soothed his nerves, cleared and sharpened his intellect, satisfied and calmed his mind or induced repose? Even though his nerves were irritated, his intellect dull and exhausted, his mind restless and his eyes sleepless, has his cigar given him the least relief? What evidence have we beyond the assertions of the users of tobacco whose nerves are already perverted, that the exhilaration of which they tell us causes any greater enjoyment of life than would have been experienced had tobacco never been known? Is

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the consumer of a narcotic, who is fully under its influence, in a fit condition to judge whether or not he enjoys life better in consequence of his indulgence? If his sensibilities are perverted is not his judgment also perverted with respect to those sensibilities?

There seems to be little room for doubt that tobacco perpetrates a most successful deception upon its users by inducing them to believe that its effects are exhilarating when the so-called exhilaration is in fact only the sensation of relief from its primary effects, and a hallucination brought on by the narcotic and perverting action of tobacco on the sympathetic nerves. Had we not used tobacco ourselves to excess during fifteen years, we should not be able to speak so definitely with regard to its effects.

The dangers and the injuries already discussed as resulting from the use of tobacco are manifest; but there is an effect not yet mentioned, which threatens ultimately to produce a great national calamity — nothing less than a tendency to gradual enfeeblement of mind,— progressive loss of intellectual power and vigor. That this is no chimera known and well proven facts will testify.

In 1862, Napoleon III of France had his attention called to the facts that there were more than five times as many paralytics and lunatics in the hospitals of France than there were in proportion to the population thirty years before, and that the government revenue from the tobacco monopoly had increased during that time in about an equal ratio. He appointed a commission of scientific men to examine whether this were a case of cause and effect or only a coincidence. This commission devoted much time and attention to the young men in the government training schools, dividing the students into two classes — the smokers and the non-smokers. The latter were found so much superior physically, mentally and morally, that the Emperor at once prohibited the use of tobacco by students in all the schools under governmental supervision throughout the country.

But we are not compelled to consult the statistics of Europe in order to present examples of this kind.

Probably as conclusive evidence as the most exacting can demand in regard to the effects of smoking upon the constitution of

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the young, and even the most vigorous among the young, is to be found in the testimony given by the action of the authorities of the U. S. Naval School at Annapolis, and those of the military academy at West Point. It is well known that only lads who are close approximations to physical perfection can pass the rigorous examination to which all candidates for admission are subjected at these institutions; if such boys as are there to be seen cannot endure the strain which tobacco puts upon them, it is fair to ask, who can? Yet, after a full trial of the experiment, extending over the period of three years, we find Dr. Gihon, Medical Director of the United States Navy, using the following language in regard to the use of tobacco at the Naval School:

"I have urged upon the superintendent, as my last official utterance before leaving this institution, the fact, of the truth of which five years' experience as health officer of this station has satisfied me, that beyond all other things the future health and usefulness of the lads educated at this school require the actual interdiction of tobacco. In this opinion I have been sustained not only by all my colleagues, but by all other sanitarians in military and civil life whose views I have been able to learn, while I know it to be the belief of the officer who is to succeed me in the charge of this department, and who was one of the board of medical officers which in 1875 reported 'that the regulations against the use of tobacco in any form cannot be made too stringent.' Since three successive annual boards of visitors have indorsed the prohibition of tobacco as a 'wise sanitary provision,' and the last of these boards on being informed that the regulation against its use was not then in operation (June 10, 1879) emphatically recommended that 'its strict enforcement be at once restored.' * * * * * * * * * * * * An agent * * * that is actually capable of such potent evil, * * * which determines functional disease of the heart, which impairs vision, blunts the memory, and interferes with mental effort and application, ought, in my opinion as a sanitary officer, at whatever cost of vigilance, to be rigorously interdicted. * * * * * * * * * * * * The difficulty of restraining smoking should be no more valid excuse for its tolerance in the face of sanitary objections of such magnitude than for the toleration of 'frenching, or gouging, or hazing.' The use of stimulating liquors is forbidden, but that the regulation prohibiting it is evaded is shown by the empty whisky bottles which are picked up outside the cadets' quarters; but it is not proposed to allow drinking on this account, although as a sanitary fact, a half-pint of table claret or of beer would be a wiser indulgence than a cigar or the innumerable cigarettes, which latter there is

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good reason to believe cause injury to the health from other agents than the mere tobacco which they may contain.

"I have dwelt at such length on this topic feeling assured that I shall have done no act of greater good to this school, in the success of which I have so profound an interest, than if I can succeed in saving its pupils from the impairment of health which is sure to result from the unrestrained premature use of tobacco."

We doubt not that many a parent in this broad land thanked Dr. Gihon from his inmost heart for the exhibit of the evils following on the use of tobacco by growing boys, however robust, made in the paper from which the above extracts are quoted. And Rear Admiral Rodgers deserved their gratitude no less when he issued the following order, which explains itself:

"U. S. NAVAL ACADEMY, *Annapolis, Md., June* 14, 1881.

"*Order No.* 1.

"The experiment of permitting the Naval Cadets to smoke at the Naval Academy having been fairly tried for nearly three years, has been found injurious to their health, discipline and powers of study.

"The Medical Officers of the Academy and the Academic Board urge in the strongest terms that this permission to smoke be revoked.

"Therefore, with the consent of the Honorable, the Secretary of the Navy, I have to forbid the further use of tobacco by the Naval Cadets, and to declare that the prohibition in relation to tobacco contained in paragraph 169 of the Naval Academy regulations will be strictly enforced.

(Signed) "C. R. P. RODGERS, *Rear Admiral, Sup't.*"

And not only at the Naval School has this salutary action been taken. "The recommendation of the Academic Board that paragraph 129, Regulations of the U. S. Military Academy of 1877 be expunged, and that the following be substituted for it: *The use of tobacco in any form by Cadets is prohibited;* has been approved by the Secretary of War. General Order No. 6. June 11, 1881, Headquarters U. S. Military Academy."

If youth be the flower of a nation, and if it be in the flower that we are to look for the promise of the future fruit, surely no wiser steps could have been taken than those indicated in the two orders just quoted — orders which being enforced will certainly increase the vigor even of the elect of our youth who constitute the membership of these two great national schools, and can hardly fail at the same time to confer on them the graces of an added refinement.

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Tobacco and its Effects.

Another point connected with the use of tobacco, the consideration of which no physician *can* and no parent *ought* to overlook, is that of heredity — the question of the transmission of various traits, not only to the immediate descendants but to those more remote. This question is so extensive, and involves such important considerations of family entailments and social and race deterioration or elevation, that we trust we shall be pardoned for dwelling upon it a little, the more especially as the records of our insane asylums point clearly to some cause for the rapid increase of brain and neurotic troubles. Should this cause prove to be the abuse, to say nothing of the use of tobacco, we may yet find that the germs of premature decay thus widely spread over the land are more dangerous than those other germs of whose deadly powers we have of late years heard not a little.

It is a fact within the experience of every one, that a scar upon the body remains practically indelible through life; that it can neither be washed out nor worn out; that in spite of all the changes incident to growth and waste and repair, notwithstanding the continual flux of particles, it is constantly and accurately reproduced. A child is born and meets, it may be in the years of infancy, with some accidental injury which causes destruction of tissue and a consequent scar; that scar remains to mark the site of the injury through the whole existence of the individual, goes with him into his coffin, and remains to prove his physical identity until the body decays. But not one single particle of all the many particles that went to make up the body of the child at the time the injury was received was buried with the body of the man when at last he died. *Something* reproduced that scar, however, as the body grew and as the system threw off particle after particle, day by day and hour by hour, until the renewal was completed, then only to be recommenced; and that something which constituted the identity of the man was injured by the accident which produced the scarring. Here is a mysterious fact, but none the less incontrovertible, right before every one of us each day; and what is true of the comparatively coarse outer integuments of skin and muscle is also true of the marvelously delicate tissues that go to make up brain and nervous

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system. Our great psychologists seem tending toward the conclusion, which some at least among them have fully adopted, that the characteristics, mental and physical, which distinguish whole families, in some cases whole tribes and nations, are attributable to alterations of tissue which partake very much of the nature of the alteration produced by an injury which we call a scar, and which, when affecting the delicate nervous and cerebral tissues, may be transmitted from one generation to another. "The fathers have eaten sour grapes and the children's teeth are set on edge."

Men cannot live without acquiring habits, and these habits which react on bodily conformation to a greater or less extent, do the same thing, it is highly probable, on the mind. Who can doubt, that has ever listened to an old man telling for the hundredth time some story of his younger days, that the habit of telling has induced some permanent effect upon his brain tissue — that the mind is moving, as it were, in a groove? And who can doubt that habit, whether good or bad, acts upon every one much in the same way, producing grooves which are made deep and yet deeper by every repetition of the habitual action, which in its turn is thus rendered more and more easy, until it at last becomes automatic, instinctive, practically a part of the organization of the individual, ready to be transmitted to his offspring, and through them, it may be in an intensified form, to distant generations?

Thus when the appetite for tobacco is fully established, as it has been in instances almost innumerable, when an individual has come so fully under its influence that to forego its indulgence is an impossibility, there can be little room for doubt that some change has been brought about in his organization that may be, and very possibly often is, transmitted to his children. It would, perhaps, be too much to say that a child of the second generation will come into the world with an appetite for tobacco fully formed; but it seems exceedingly probable that, with this or any similar habit firmly fixed in the father, a modification of the system has been brought about which may be transmitted in a less decided degree to the child, for whom the formation of the habit or the acquisition of the appetite is thus rendered easier — in whom perhaps its

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development at a comparatively early age may be looked for with a great confidence; and it is evident that but a few repetitions of this process in successive generations are needed to produce a family, or a tribe, or even a whole race, in whom the habit shall be innate and shall appear among the earliest manifestations of liking or disliking. That this is not a mere theory — that, so far from such being the case, it is an established fact — is proven by the testimony of travelers in East India and among those races of Central and South America with whose ancestors the use of tobacco probably first originated, and where we are told that children yet unable to walk are to be seen carried at the mother's back, papoose fashion, or astride of her hip, puffing at a cigarette, identical in kind with that which the mother herself is enjoying, and seemingly finding it more of a necessity than many things which our own children reckon among the essentials of existence! Do we desire to see any such state of things in our own country? It is not enough to say that such instances are to be met with only among barbarians; we have only to keep our eyes open as we walk the streets of any of our cities to see that the tendency is toward that consummation; if further evidence than that thus obtainable is wanted, we have only to consult the records of the United States navy to learn that "the most prominent cause of rejection of candidates for apprenticeship is irritable heart, caused in most cases primarily by tobacco." Do such things look as though there were absolutely no danger? Do they not rather point to the conclusion that the tobacco habit is making seriously rapid headway among us by means of heredity as at least one of, it may be, many causes.

We are well aware that other views are taken than those that we have thus far expressed. We know that medical journals have lately claimed that the use of tobacco is upon the whole rather beneficial than otherwise; that it is pleaded in extenuation of the many heavy indictments drawn against it, that it produces no organic lesions which the scapel of the *post mortem* examiner can detect; that the damage produced is rather functional than structural; that it works badly with only a minority of the many who use it, and that if it be once given up all bad effects disappear, if not

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immediately, certainly very soon after its discontinuance. We know, moreover, all that is claimed for it on the score of its widespread use and on the ground of the testimony in its favor by the many who employ it, but we note that all physiologists, with so far as we know not a single exception, condemn its use by those who have not yet attained their growth.

The late Professor Parke, himself, if we mistake not, a smoker, says: "I think we must decidedly admit injury from excess; from moderate use I can see no harm except it may be in youth." And this is the most favorable utterance we have found, for even in the periodical from which we take the above extract, we find in close connection with Dr. Parke's utterance the following: "If we are willing to accept the opinions which sanitarians in other nations have formed, we have a very decided one ready to our hand in Switzerland. That intelligent republic enacted a law last year (1880) prohibiting the sale of tobacco to minors under fifteen years of age, and making it an offense against the law for such to smoke. Hence a boy of twelve or fourteen who parades the streets of Geneva or Berne with a cigar in his mouth is liable to be arrested and committed to the police station; and, as they have a disagreeable habit in that republic of enforcing the laws they enact, such would pretty certainly be the juvenile smoker's fate. We recommend to our fellow countrymen their manner of dealing with the habit, which, whether harmless or not to most adults, *is unquestionably of gerat injury to young boys.*" And another periodical of equal prominence in medical science says: "It is the duty of our public school instructors to make the facts in regard to tobacco known and impressively felt by their scholars, and we hope that this field of sanitary mission work will be actively occupied. Sewergas is bad enough, but a boy had better learn his Latin over a trap than get the habit of smoking cigarettes; for we may lay it down as certain that *tobacco is a bane to youth*, though it may be the proper indulgence of manhood and a solace to old age." To both of which we think it may be added, that if the habit be not acquired in youth, there is no very great probability that it will be taken up by many in later life. If no tobacco is used except such

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as may prove "a proper indulgence to manhood and a solace to old age," the present enormous consumption will very soon be diminished greatly, and will in all probability never again be reached.

As illustrating the effect of tobacco, even upon an individual habituated to its use, the following experiment, which may easily be repeated by any physician at almost any time, has interest. A young man aged twenty-four, of full habit and accustomed to smoking, was selected and kept perfectly quiet in a sitting position until his pulse was entirely regular at 75.5 per minute, a rate which it maintained steadily, thus indicating the freedom of the subject from all excitement. When this condition was reached he was given a pipe to smoke, all else remaining as before; during the first five minutes of smoking the only perceptible effect was an increased fullness and firmness of the pulse, the rate remaining as above; in the course of the succeeding sixteen minutes the rate increased, being when noted, 87, 89, 95, 98, 103, 104, 105, 105, 107, 108, 111; an increase of temperature was also noted, ending in perceptible perspiration. Smoking was now stopped, the individual still remaining quiescent; the pulse continued to increase in frequency slightly for one minute longer, rising to 112, when it began to decline; at the end of thirty minutes it was 89 and had not reached its normal rate of 75.5 at the end of two hours. It is hoped that others will repeat this simple experiment and record the results obtained; it may be varied moreover in ways that will readily suggest themselves to any intelligent observer, and being thus repeated and varied, an amount of information now wholly lacking can hardly fail to be obtained and rendered available for future use.

An important point in connection with the tobacco habit yet remains to be discussed, important as having a bearing upon immense pecuniary interests, i. e., its effect upon life assurance. Every one who has ever made application for a policy of this kind must have observed that considerable stress is laid upon the physical condition and general health of parents and other relations; the reason for this is obvious; the applicant may not at the time of insurance have exhibited any failure of power, but the examiner by his sur-

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vey of the family history, especially that of the immediate progenitors, obtains the means of judging with tolerable accuracy his power of resisting strains, of combating with success any morbid influences to which he may be subjected. By means of auscultation and other methods of examination many points of the physical health can be determined with absolute certainty, but there are as yet no special tests by which the condition of the brain and nervous system can be ascertained; hence the inquiries into parental conditions have an importance in this direction also. If now there be any truth in the ideas put forth in a previous portion of this paper in regard to the possible inheritance of the tobacco habit, the importance of the whole matter in relation to assurance will be readily apparent. Space does not admit of any further discussion of this subject; it must suffice us if we have called the attention of insurers and insured to a point which we believe may yet assume vast importance in the consideration of their relations to each other.

In conclusion, we have to call attention to the information contained in the pages which follow these — information worthy of the closest attention, whatever may be the opinion formed of our own work and views. The series of questions given was sent to nearly all the prominent medical men of Wisconsin, a very large majority of whom responded at considerable length; some who did not, being prevented, not by any lack of interest in the subject, or by any failure to recognize its great importance, but by the want of time to answer as fully as seemed desirable. To all we offer sincere and hearty thanks as now we bring our own personal work to a close.

Mr. Sally, of St. Thomas Hospital, uses the following language: "It is my business to point out all the various and insidious causes of general paralysis, and smoking is one of them; I know of no single vice which does so much harm as smoking; it is a snare and a delusion. I believe that cases of general paralysis are more frequent in England than they used to be, and I suspect that smoking tobacco is one of the causes of that increase; of this being the case in America there is no doubt."

Dr. Williams Henderson, in his "Plain Law for Improved

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Health," speaking of insanity from the use of tobacco, refers to a gentleman who, from having been one of the most fearless and healthy of men, became one of the most timid. He became unable even to present a petition; much less could he say a word concerning it, although he was a practised lawyer; he was afraid to be left alone at night. Though perfectly temperate in other respects he had used tobacco to excess.

In the *Lancet* (Jan. 1857), Mr. Fenn thus describes the result of his investigations: "On account of its softening and relaxing effect upon the mucous membrane of the bowels, tobacco is greatly resorted to in habitual constipation, but the susceptibility of the nervous system is greatly depressed, and the vital force diminished by its use."

In the preparation of this paper and its appendix, we have made use of material from the writings of Pereira, Prout, Bright, Radcliff, Orfield, Trousseau, Johnson, Brodie, Sizars, Jackson, Wells, Smith, Taylor, Budget, Rumbold, Richardson, Landon, Parker, and it may be of others whose names are not given, though such omission is wholly unintentional.

We have also to make acknowledgment of our indebtedness to the following gentlemen for personal communications and other effective assistance in various ways: Drs. W. Kempster, B. M. Gill, A. W. Bickford, H. H. Parrott, H. B. Cole, G. R. Taylor, L. G. Armstrong, E. L. Beverly, B. C. Brett, O. N. Murdock, E. Ellis, I. W. DeVoe, J. D. W. Heath, C. A. Rood, L. J. Smith, H. P. Wenzel, G. W. Jenkins, G. Seiler, L. Wade, R. Broughton, D. B. Wylie, G. W. Jones, J. T. Reeve, Prof. T. W. Chittenden, Drs. Clark, Day, Fenn, Goodwin, Jones, Vincent, Whitman, and many others.

CORRESPONDENCE ON TOBACCO AND ITS EFFECTS.

In order to obtain the freshest and most direct testimony with reference to the effects of tobacco, the questions which follow were addressed to about one hundred and fifty correspondents, the most of whom are prominent physicians of our own state. Our space

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admits of the presentation of a condensation only of the information received in answer, and this condensation is compressed into the smallest possible limits. Were it possible, however, to print at full length all the communications received, we doubt that any additional strength would be given to the case we have presented; although the matter is full of interest and would be read with profit by very many, the general drift of the testimony given is all in one direction.

Taking each question in its order, we have classified the answers received, giving at full length only such as have special interest, whether they are in accordance with the majority or not. From the nature of the case a simple yes or no in answer to many of the inquiries was not practicable or desirable. One reply often contained several distinct points each having an importance of its own.

Question 1. "What good effects from the continued use of tobacco have come under your observation?"

Answered substantially as follows: Eighty-five per cent. reply that no good results have been observed from such use. One correspondent has observed a few cases of Pyrosis which had been relieved by the use of tobacco, and has also seen the relief of constipation. One considers that it has given relief in certain dyspeptic troubles, producing, however, other disabilities equally bad. One says that tobacco has appeared to produce free expectoration in some instances. One knew of no good effects from the use of tobacco except what he had heard others speak of. One claims to have been cured of chronic Laryngitis by the use of tobacco. One has heard of a gentleman who thought that smoking had relieved Asthma.

Question 2. "What if any adulterations of tobacco have come under your observation, and what have been the effects of such adulterations?"

Answered substantially as follows: Ninety-four per cent. answer that they have not met with any adulteration. One has met with tobacco adulterated with copperas, to which attention was called by the effect produced on the mucous membrane of the mouth, and ulcers which it caused upon the tongue.

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Tobacco and its Effects.

Question 3. "In your opinion is the use of intoxicating liquors in any way fostered or affected by the habitual use of tobacco? If so, please state how and why."

Seventy-six per cent. answer this question by an unqualified affirmative. Six per cent. say no. Five per cent. do not know, and the remainder give no answer.

One correspondent makes answer that it depends upon the individual. Another says: "I have seen many cases where the use of tobacco in youth has led to the use of intoxicating liquors also." A third says: "In my opinion the use of tobacco fosters that of intoxicating drinks by reducing the powers of the nervous system; liquor is then used as a restorative and is about as active a one as I have found." A fourth replies: "I have considered the use of liquor as a necessary result of the use of tobacco, and have found no boys who use the first who did not begin with the second."

"Experience demonstrates that those nations which are most addicted to the use of tobacco are also the most prone to drunkenness. This follows first, physiologically, by the fact that tobacco produces an atonic condition from which nature seeks relief; and second, psychologically, because tobacco vitiates the mind and begets drunkenness as one vice begets another."

"My observation strengthens my belief that the constant use of tobacco creates and fosters a perverted taste for intoxicating liquors; the social ties of a chronic tobacco consumer exert a peculiar influence over him so as more easily to dispose him to the use of intoxicants."

"The narcotic properties of tobacco undermine the nervous system, and create what are called tobacco diseases, and the almost universal testimony is that all topers, both old and young, first used tobacco freely."

"The effect of tobacco in many cases is to produce a depression of the heart's action, to overcome which a strong desire for stimulants is established. This can hardly be otherwise from the very nature of the case; since the Nicotine of tobacco has a direct tendency to the heart, affecting its action at once, and more or less in proportion to the extent to which tobacco is used."

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Tobacco and its Effects.

"I will not make the charge, sometimes made, that tobacco is a common stepping-stone to drinking, but all our inebriate asylums consider it useless to try to reform a patient so long as he is allowed to continue the use of tobacco."

Question 4. "In the treatment of any particular class of disease, or of wounds and injuries, have you met with any serious difficulty due to the habitual use of tobacco by the patient? If so, give details."

The answers to this question may be classified as follows: Seventy per cent. answer yes. Twenty-five per cent. say no, and the remainder make no reply.

"Inasmuch as the excessive use of tobacco interferes with nutrition and absorption, should we not expect a depressing effect upon the growth and repair of tissues? And since tobacco is universally acknowledged as a debilitating agent, we should not be likely to look for a rapid building up of injured tissues under its use. I have never had good results, and never expect to have them, in cases where tobacco has been applied directly to wounds, as is the foolish practice with many working men; in not a few cases in which extensive injuries have been done up with tobacco and kept in that condition for a length of time, the process of repair has been much retarded."

"In one instance I had a case in which a person had bitten his tongue while smoking a cigar; the wound seemed to be poisoned, and extensive inflammation and ulceration followed, with serious results."

"I have seen instances where death has followed severe injuries, the patients having been habitual users of tobacco, in which I could attribute the fatal result to no other cause than the depression of the vital powers resulting from long use of the weed."

"It is scarcely possible to comprehend the amount of harm the use of tobacco produces in some cases of venereal disease. I think it may safely be said that severe syphilitic or gonorrhœal cases more frequently pass uncured than cured if the patient continues the excessive use of tobacco."

Question 5. "Have you observed any local effects of tobacco

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upon the mucous membrane of the nose, the throat, or the ear, which leads you to suspect that it acts as a predisposing cause of Catarrh or other disease? If so, give details."

Sixty-eight per cent. of the replies to this question are in the affirmative, thirty per cent. in the negative. One "has cured several cases of Catarrh by withdrawing the use of tobacco." Another "regards the constant use of tobacco as the source of a chronic inflammation of the throat and fauces that can never be misunderstood by an experienced eye."

"I have seen ulceration of the lips in those addicted to constant use of tobacco which was traceable directly thereto; in not a few cases Catarrh was present, manifested by a nasal sound in talking, due to the thickening of the lining membrane of the nose and its appendages."

"I have met with many cases of congestion of the pharyngeal mucous membrane, sometimes extending to the ear and sometimes to the larynx, producing hoarseness. It would seem that the pungent oil of the tobacco volatilized by the heat constitutes the exciting cause — at least I have always found such diseased condition difficult to reach except by requiring the unconditional surrender of its use; usually thereafter treatment has been easy and successful."

"I have observed that in some cases smoking has produced Eczema of the nasal mucous membrane and chronic Conjunctivitis; I have also seen irritable cough and, in a few instances, violent heart disturbance and gastric irritation, all of which have disappeared upon stopping the use of tobacco."

Question 6. "Have any cases of the following diseases come under your observation which you believe to have been caused by the use of tobacco: (a) Ulceration of the lips; (b) Epithelical cancer of the lips or mouth; (c) Any local disease of the tongue, gums, tonsils, pharynx, etc.? If so, give particulars."

The replies to this question may be arranged as follows: (a) eighty-one per cent. answer yes; (b) fifty-nine per cent. answer yes, twenty-five per cent. say no, sixteen per cent. give no answer; (c) ninety-five per cent. say yes.

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Tobacco and its Effects.

"I have seen two cases of Epithelical Cancer of the lips, one case of ulceration of the lips, one of ulceration of the tongue, and two cases of Glossitis from the use of tobacco. I know that it was the direct cause, for when its use was discontinued all the cases improved rapidly."

"In one case, that of a lady who smoked a short pipe for a long time, the tongue became swollen to an alarming extent; it was found that the pipe was the cause. I have also seen Cancer of the lower lip in one long accustomed to the use of a pipe — the tumor requiring excision."

"Mr. ——— smoked freely from the age of twelve. At the age of sixty-five was obliged to have a Cancer removed from the lower lip, due in my judgment to the use of tobacco."

"I have had a fair opportunity to notice these diseases as they have from time to time appeared in one form or another. I have treated several Epithelical Cancers which I have no doubt were the direct results of the long continued use of tobacco, combined with the irritating effects of the pipe or cigar."

"I have had two cases of Epithelical Cancer supposed to have been the result of smoking, but I cannot give details."

"I have had two cases of Cancer of the lip, one caused by using a pipe which had been used for many years and was saturated with the empyreumatic oil."

"I have seen one case of Epithelioma of lip, from the use of an old pipe; also a case of Cancer of posterior portion of tongue in an incessant chewer; it proved fatal."

"I have seen several cases of ulceration of the lips, and two of Cancer of the lip, undoubtedly caused by use of the pipe."

"I have operated upon three cases of Cancer of the lips directly traceable to the use of a pipe."

"A young man aged thirty had smoked almost incessantly for ten years; at the expiration of the first year of this practice an ulcer developed upon the tongue near the center, which greatly annoyed him, but not suspecting that tobacco had anything to do with it he continued to smoke to excess. At last he was compelled to stop because he could not put a pipe in his mouth without ex-

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quisite pain, and then he began to improve. I have no doubt that tobacco was the original cause of the whole difficulty; since abandoning it he has grown better steadily."

Question 7. "Do your observation and experience enable you to enumerate any constitutional derangements resulting from the use of tobacco? e. g., Dyspepsia, Disease of the stomach, heart, etc."

Ninety per cent. of those questioned say yes; two per cent. say no; and the rest make no reply.

"I frequently meet with and treat cases of Dyspepsia, Nervous Irritation, Palpitation of the heart, nervous depression and the like, which are traceable directly to the excessive use of tobacco. In all such cases, if the trouble be not too far advanced, recovery is quite probable on the entire discontinuance of the habit."

"I am fully persuaded that many cases of Dyspepsia are produced by the use of tobacco. I have prescribed for such cases frequently, and find improvement only when the tobacco is discontinued."

"I have treated a multitude of cases of disease of the heart and stomach where I had the best of reason to suppose that tobacco was the main cause of the trouble, all bad effects disappearing when its use was discontinued. Dyspepsia in young men is caused in many instances and greatly aggravated in many more simply by smoking to excess."

"I feel certain that abuse of tobacco, however employed, may be classed among the causes of chronic disease, e. g., severe forms of irritable Dyspepsia, disturbed action of the heart and the like. Young gentlemen who are in the habit of putting this enemy into their mouths do not become aware of the danger sometimes until too late."

Question 8. "What is your opinion, founded on your own experience, as to the effects of tobacco in producing diseases of the brain and nervous system, e. g., Congestion, Apoplexy, Epilepsy, Paralysis, Nervousness, Impotence, etc.?"

Of the replies to this question, ninety per cent. say that the writers believe tobacco to be the cause of such diseases in many instances. Six per cent. give no answer.

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One "thinks that he has met a few cases where such diseases could be traced to the effects of tobacco."

"During thirty-six years of medical practice I have had unusual opportunity of seeing various forms of brain disease; have treated Epilepsy, Paralysis, Congestion, Apoplexy, Nervousness and Impotence which I knew were traceable to the use of tobacco from the fact that when the habit was given up the patients recovered. I have frequently met with persons suffering under one or another of these forms of disease whom I knew to be smokers and chewers, and in whom I believed the result to be due to the tobacco habit."

"I have treated two Epileptic cases, and numerous cases of nervousness directly due to tobacco.

"Under certain circumstances tobacco will help to produce all the troubles enumerated, and will help to make them worse when they arise from other causes."

"I have no doubt that the use of tobacco is worthy of the special attention of practitioners of medicine as a very frequent but unconsidered cause of disease. I am very certain that if the doctor directs his attention to the subject he will find in the tobacco habit an explanation of many obstinate and difficult cases. I do not doubt that the excessive use of tobacco aggravates Phthisis; I have seen cases of Amanrosis that were unquestionably due to its use."

"Amanrosis is a very common result of smoking to excess, but I have never seen it produced by snuffing or chewing. So far as I have been successful in treating it at all, it has been by securing an unconditional surrender of the use of tobacco."

"Loss of memory takes place in an extraordinary degree in smokers."

Question 9. "What is your opinon as to the possibility of a diseased condition of any kind being caused by tobacco and being transmitted by inheritance?"

The answers to this question were very diverse. Fifteen per cent. of our correspondents, however, think that a weakened and nervous state of the system caused by the excessive use of tobacco is frequently transmitted and manifested in the offspring. Twenty-

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five per cent. reply that diseased conditions from the use of tobacco may be and doubtless often are transmitted from parents to children. Ten per cent. admit the possibility of such transmission, but deny that it is probable. Twenty per cent. think that nothing of the sort is possible, while the remainder either answer very indefinitely or not at all.

"I am acquainted with two brothers, both of whom have been inordinate lovers of tobacco from childhood, doubtless owing to transmission of the habit from both grandparents."

"As the child is, as a rule, the reflex of the parents both mentally and physically, he will partake more or less of the defects of their constitutions; in other words, his constitution will contain the seeds, which in time will surely develop, of faults mental and physical."

"I am firmly of opinion that tobacco as well as alcoholic stimulants creates diseased conditions which will manifest themselves in the second generation."

"I have noticed what I thought a transmitted tendency in the children of a few families, some of whom were lovers of tobacco from a very early age. These children, in one instance, were born after the father became a habitual user of tobacco, while their brothers and sisters, born before that time, had a perfect loathing for it. Such a fact seems to me very significant."

Question 10. "Have you observed whether or not the rapidly extending use of tobacco during recent years has been efficient in producing disease of any specific kind, especially of the nervous, respiratory or digestive systems?"

Forty-five per cent of the replies to this question were in the affirmative, twenty-five per cent. in the negative, and the remainder, thirty per cent., of the correspondents made no response.

"Tobacco is undoubtedly one chief cause of the rapid increase of Dyspepsia, nervous debility and all the long train of symptoms of nervous trouble so common among our business and professional men, and those who lead sedentary lives."

"I do not think that there is an article in use in this country whose legitimate effect upon the nervous system tends to induce deterioration more decidedly than does the effect of tobacco."

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Tobacco and its Effects.

"As our studies of the causes of disease acquire the definiteness of science, and convictions of the laws and requirements of bodily health are forcing themselves upon us, the evils to the physical life of society that result from whiskey and tobacco become more and more apparent. I have little hesitation in attributing a very large proportion of some of the most painful maladies that come under my notice to the ordinary and daily use of tobacco in the quantity usually deemed moderate."

"While there are differences in the medical estimate of tobacco, and differences to some extent in opinions as to the toleration of its use which can be established or endured by individuals, there is yet great uniformity of the opinion as to unadvisability of its use under any pretext whatever. No person or community need make the effort to use tobacco extensively in any form, without the expectation and assurance that the result will be continued injury to the individual and enfeeblement to the race. I do not mean to say by this that one cigar or one pipe of tobacco will leave the partaker permanently impaired, any more than I would assert that the loss of one night's sleep is a permanent injury to a person in fair average health; but it should be understood that the general line of direction is toward the impairment of vital force and hence toward prostration and serious nervous disease."

"I think the majority of my office patients are those whose systems have been shattered by the excessive use of tobacco; the effects of this drug and its entailments are not sufficiently taught by the medical profession."

"Experience and observation alike show that the use of tobacco is producing a rapid increase in the amount of nervous and pulmonary disease. Hence comes also a demand for whiskey to counteract the depression caused by tobacco, and from both we have broken-down constitutions and premature exhaustion in the offspring of their consumers."

"I answer your questions generally by saying that I believe that the use of tobacco tends to promote intemperance by causing profuse expectoration and consequent exhaustion which calls for stimulating liquors. During thirty years in which I used tobacco I laid

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the foundation for Dyspepsia, diseased throat, Catarrh and general derangement of the nervous system, which now, after twenty years' abstinence, still maintain a hold upon my bodily, mental and moral powers; and though the effect is far less injurious than it would have been had I not reformed, I must regard the formation of the evil habit as one of the gravest sins of my life."

"We are told that Nature never forgives sins committed against her by individuals; that the record of offenses against her is never effaced; that the penalty is always exacted to the uttermost; and I have never been more firmly convinced of these facts than when attempting to treat the long train of nervous and digestive troubles traceable, directly or indirectly, to the use of tobacco in one form or another that are continually coming before the physician for his attention. I do not suppose that a practicing physician can be found who will not admit that if no tobacco in any form were used during ten years within the sphere of his observation and practice, a most noticeable change would take place in the character of the diseases presenting themselves for treatment."

Question 11. "What effects have you observed resulting from the constant use of tobacco among professional men and students generally?"

Of those answering this question twenty-five per cent. say that they have noticed none; fifty-five per cent. made a great diversity of replies, some of which are given below, the tendency of all being in the same direction, and from the rest no answer was received.

"I believe that the habit of using tobacco in various forms is not only laying the foundation for many diseases of serious character and not easily removed, but that it is damaging the moral fibre of many of our students."

"It is a rigorous rule of athletic regimen that the oarsman must put away his cigar and the pugilist his plug when they go into training. This is the smoker's frank confession, that tobacco robs him of strength, that he is in better condition without it; he cannot smoke when he would be at his best, when he would have every nerve and muscle at its steadiest. But is there ever a time when it is not worth while for a man to be at his best? Success in the

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supreme endeavor of life would seem to be worth as much as success in a prize ring or regatta, and by the same system of analogy it is evident that if the student would be at his best he must put away his cigar."

"All our professional men should know that the ill effects of tobacco upon the system are less easily observed and more insidious than is usually supposed. I am sure that the habit is incompatible with great and long continued intellectual activity; and since we physicians as a class know its harm physiologically, it appears to me that it is our duty to discourage a habit that is not conducive to health, and that we are criminal if we give countenance to a habit which is known to engender nervous troubles of a very serious kind. Professional men and students should be made more fully aware than they sometimes are of the tendency of the habit and its results."

"During the last ten or fifteen years the consumption of tobacco has so increased, especially among young people, that we can hardly hope to comprehend its influence. It is my belief that its use among the young cannot be too strongly condemned; very few students who make a free use of tobacco stand at the head of their classes."

"It is not often that one great catastrophe overthrows the mental health of the student; it is the constant recurrence of unfavorable circumstances or acts, the gradual accumulation of adverse surroundings, the steady disregard of healthful conditions, which heap misfortune upon the individual; the often repeated disregard of the common laws of hygiene, deviations from established principles, the thousand and one little things which tend to depress vitality and produce disease, all these are the operating causes, and prominent among them stands the increasing use of tobacco among the younger students at the present time."

"Nervous prostration and a strong tendency to the use of stimulants and narcotics as alcohol and opium are among the evils likely to overtake the student of tobacco-using habits."

"An unsound mind is ever the outcome of an unsound body, caused by a violation of law committed through ignorance, which

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was not accepted, however, as a reason for exemption for the penalty. What seems needful for the medical profession to teach at the present time is how best to maintain the mental faculties in a state of health. The insidious effects of the tobacco habit should be pointed out and kept in mind if we would look to the welfare of the professional man and student, and to the welfare of society at large. The youth of our land should be taught that the use of tobacco arrests the growth and development of the body, producing low, dwarfish stature, pallid and sallow hue of the surface, insufficient and unhealthy supply of blood, and diminution of both bodily and mental power. Children should under no circumstances be allowed to use tobacco in any form."

Here we close our extracts from the abundant testimony given by our numerous correspondents. The following conclusions appear to be established as the judgment of the representative, thinking portion of the medical men of Wisconsin, a class including by far the larger part of the profession:

1st. That smoking, even in what is usually considered moderation, is, to say the least, injurious indirectly, most especially to the young, inasmuch as it is notorious that the habits of drinking and smoking are very intimately associated, and that the practice of the latter may easily lead to the former — that the use of tobacco may become an inducement to the excessive use of intoxicating liquors, with all its accompanying evil results.

2d. That beginning the use of tobacco in early life cannot be too strongly condemned as producing most pernicious effects upon the constitution of the young, and as impairing greatly, if not wholly destroying, the chances of success as students and scholars.

3d. That whatever may be said in favor of the use of tobacco in moderation, its employment in excess, especially if long persisted in, is injurious to any one, physically, mentally and morally.

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EXTRACTS FROM SPECIAL CORRESPONDENCE.

From the communications received at the secretary's office in answer to the inquiries addressed to the correspondents of the board and local health officers, and from the notes of the clerks of local boards in connection with their more formal reports, we make the following extracts containing matter of general interest. To all the gentlemen who have favored us by entering into correspondence with us in answer to our request, we tender sincere thanks; many notes from which we have taken nothing for publication have been of as much value in the prosecution of our special work as those from which are drawn the quotations which follow. Such notes have been received from Drs. M. B. Axtell, I. J. Bennett, G. A. Bodenstab, M. T. Darling, B. M. Gill, L. O. E. Manning, J. Schroendener, J. B. Whiting and others.

For convenience of reference the notes are arranged in the alphabetical order of the towns from which they were received.

From ALMA; *Dr. G. Seiler:*—I think that in general there would be little if any objection to compulsory vaccination, if it were done at public expense. The state ought to oversee the distribution of proper lymph among physicians, and the health officers, who should be physicians, ought to be required to vaccinate all children. Such are the rules in Europe, and there seems no good reason why they should not be enforced here also.

Our village has a nominal health board, consisting of two members, but no meeting has ever been held, and, if any advice has ever been given or any suggestions have been made, no attention has been paid to them by either the authorities or the people. The members of the board receive no compensation.

From BLACK RIVER FALLS; *Dr. H. B. Cole:*—But a very small proportion of the people here are unvaccinated. I think that a compulsory law concerning vaccination would not be looked upon

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Extracts from Special Correspondence.

with very great favor; matters might, however, be so managed that there would be no objection made.

I have seen no marked effect upon health as a result of the cold of last winter.

From BRODHEAD; *Dr. R. Broughton:*— Probably twenty-five per cent. of our school children are unvaccinated; fortunately there has been no Small Pox in this vicinity now for many years.

Three fatal cases of Diphtheria occurred here in a single family, the only ones in twelve years — and soon afterward two others, making five in all, all of which were traceable to a single house. The last mentioned cases were girls who visited and worked in the family in which the first appeared, and remained there three or four days, during which time they washed the clothing, etc., of the dead. All the cases were virulent, death occurring in from four to six days.

From BRILLION; *Dr. I. McComb:*— Not more than two-thirds of the people here are vaccinated; I think compulsory vaccination would be favored by public sentiment.

I think that there has been a decided increase in the amount of sickness, due to a considerable extent to the extreme cold of last winter.

We have no health board; I hold the appointment of health officer, but thus far have received no compensation.

From CEDARBURG; *Dr. J. A. Russell:*— This community is, or has been, vaccinated almost as a whole; but, as very few believe in a repetition of the operation, it is probable that very few would prove invulnerable in case of an epidemic — certainly not more than one-third would be safe. I think that public sentiment would support compulsory vaccination.

We have had one case of Cerebro-Spinal Meningitis — a boy of fourteen — which seemed to be due from exposure.

There were also several cases of injury from toy-pistols, but no Tetanus resulted so far as I am informed.

From COLBY; *Dr. D. R. Freeman:* —There has been no vaccination done in this town since my acquaintance with it began, now a period of six years. Means should be at once adopted to secure

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its performance generally, especially in thickly settled districts and in the public schools.

There has been no sanitary work done here, no meeting of any health board, and no compensation paid to any health officer.

From COLFAX; *Dr. E. Monteith:*— About one-half of our people have been vaccinated and there would probably be no difficulty in inducing all to submit to the operation. I have very little trouble in persuading them to do what they can see to be for their advantage, and this is especially true of the Norwegians.

I have had three cases of Cerebro-Spinal Meningitis, all well marked. One proved fatal and the others are still suffering from sequelæ.

There has been a greater variety of disease in this locality than is usual during the past year. Cholera Infantum and Diarrhœal troubles among older children have been especially prevalent, though not very hard to control. We have had rather less of Typhoid and Diphtheria than is generally the case. I am more and more firmly convinced that all the cases of Typhoid that I have seen have been caused by bad drinking water and filthy habits of living; I think that I could give you indisputable proof of the fact.

In my best judgment there has been on the whole but little change in the character or severity of disease in this neighborhood except as noted above.

From FOND DU LAC; *G. F. Brownson, Esq., Health Commissioner:*— With the exception of a wave of Diphtheretic influence which swept over a part of this city in the autumn of 1880, and a single mild case of Variola, contracted in Michigan, which was promptly isolated and caused no further trouble, this city has been healthy during the year.

The health department of this city consists of a commissioner and a sanitary committee composed of the mayor and two aldermen. The commissioner is the executive, and calls on the committee for help whenever he deems it necessary. Little sanitary work has been done here, other than the removal of filth from the city, and beyond the salary of the commissioner ($150 per annum), little expense has been incurred.

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From FORT HOWARD; *Dr. W. H. Bartran:*— It is quite a common practice, particularly among foreigners, to bring children suffering with malignant Diphtheria, Scarlatina, etc., some fifteen or twenty miles upon the cars for treatment.

A case of this kind occurred very recently in which a German woman brought a well-grown girl about twelve years old into this city to consult a physician; the child had Diphtheria of a very bad type, and the possible consequences to all who traveled upon the same train, or who by chance were brought into contact with the girl, are simply terrible to contemplate.

I can give instances where disease has been communicated in this way. Is there not a law to punish railroad and other corporations for carrying passengers suffering with contagious disease?

[The statute given at length in the Secretary's Report covers just such cases, and provides a penalty for making use of public conveyances by those who are thus affected, or having such affected persons in charge.— SEC.]

From FREDONIA; *Dr. J. H. Voje:*— In regard to vaccination not more than one-tenth of the residents here are fully protected. If done at public expense I think few would object to compulsory vaccination, though there might be some adults who would be opposed to its performance upon themselves at least.

The general sanitary condition of this place is, with few exceptions, good; the old log-houses, breeding-places of Typhoid, Diphtheria and Scarlet Fever, are being replaced by larger, better planned and better ventilated buildings. There is plenty of work here notwithstanding, for an active and intelligent health officer and health board, but the people are indifferent. They much prefer to pay the doctor for a bottle of some mysterious mixture to cure disease to hearing him talk about the condition of their houses, the water in their wells, the ways in which they live, and kindred matters. When Physiology and Hygiene shall be taught in every district school, and when an intelligent class of people, thus educated, shall have grown up and taken their places on the stage of life, the work of the health officer will be properly appreciated, and then — perhaps — he will be paid as he should be.

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From GENEVA; *Dr. B. O. Reynolds:*— One case of Small Pox has occurred here during the year. A young man contracted the disease in Chicago, and came home here to his parents' house just as the eruption made its appearance. He was isolated at once with all the rest of the family, and so remained for four weeks, at the end of which time bedding, etc., was burned, the house and furniture were fumigated with sulphur, and the premises generally thoroughly disinfected. No one else caught the disorder.

I think that now probably ninety-five per cent. of our people are fully protected. Compulsory vaccination would, I suspect, not be favored; yet were it not for an occasional outbreak of Small Pox and the resulting scare and panic, vaccination would be sadly neglected, and stringent laws would be needed to compel its due performance.

Our village board is also a board of health, and the president appoints a sanitary committee of three, whose duty it is to look after back yards, drains, privies, barns, ditches, etc., and if any are found in an uncleanly or unwholesome condition, to order them to be cleaned forthwith. Manure heaps are removed, rubbish is buried or burned, and if orders given to such effect are not at once complied with, the matter is reported to the board, which meets once in two weeks, and proper measures are taken to enforce prompt obedience. No compensation is paid to the board or to any of its members.

As compared with the past five years, there has been, I think, a marked diminution in the amount of disease in this place.

From GEORGETOWN; *Dr. J. Oettiker:*— From one-half to two-thirds of our residents are protected by vaccination — from which statement you will readily draw the correct inference that this important duty is left undone by far too many. In speaking with such persons I find that they all admit the benefit and necessity of the operation, but yet they fail to have it done. Probably only compulsory vaccination would meet such cases, and would meet also with public approval — at least I know of no one who would oppose it.

I have had one case of Cerebro-Spinal Meningitis, a boy of four-

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teen, brought on in all probability by remaining too long in the water while bathing, the weather being quite cold; he made a tolerably rapid recovery, but shortly afterwards had an attack of Hemiplegia.

Our health board exists only in name. Two years ago or more a complaint was made concerning some dead hogs which were left near the complainant's house, and a health board was extemporized for the occasion, but has never met since. I received a fee of $2.50 for my services on that occasion, which I believe has been the only expenditure for sanitary work ever made here.

From GREEN BAY; *Dr. B. C. Brett:*—There has not been a case of Small Pox in this county for three years—a fortunate thing for us, for we are poorly prepared to meet it, there being a very large proportion of unvaccinated children. I believe that public sentiment would favor compulsory vaccination, at public expense and with pure bovine virus.

We have suffered more from Diphtheria during the year than from any other form of contagious disease, but the mortality has been confined chiefly to the croupous form of the malady.

There were two deaths here during the summer from Tetanus, the result of injury from toy-pistols, but as the patients were not mine, I can give you no particulars.

The year has been characterized by an unusual mortality among the aged, the direct cause being acute diseases of the respiratory organs attributable to the extreme cold of last winter.

I consider bad water and poor drainage to be the two main things that endanger public health here; the number of surface wells is large, and the houses, epecially those on the flat lands, are wet; the general drainage moreover is so poor that it is a matter of surprise that we are not more severely scourged. The only reason that I can assign is the purity of the air from the bay and the lake, which may exercise a counteracting influence to some extent.

We have a board of health composed of four members besides myself, the physician; meetings are held monthly, or oftener should occasion require it. During the year two artesian wells have been

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bored for the use of public schools, and a third at the court-house, all upon the recommendation of this board; the county board, also, acting on advice of the board of health, has reconstructed the court-house privies, introducing a modification of the dry earth system, and displacing that most dangerous and disgusting of all possible plans, the underground vault. In the present arrangement the receptacle is mounted on wheels, wholly above ground, water-tight, and is designed to receive a liberal supply of dry earth night and morning, and to have its entire contents removed (and disinfected if need be) once a week.

No member of the board of health receives any compensation. The cost of the work done hitherto has been paid by the city out of special appropriations, and is unknown to us.

From GREENWOOD; *Dr. H. J. Thomas:*—Very few hereabouts are vaccinated and compulsory measures would be vigorously opposed.

I have had many cases of Scarlet Fever within ten months, complicated with Erysipelas in four instances, three of which proved fatal. Scarlet Fever has been transported in very many cases by friends who have volunteered to nurse the sick and have thereafter taken no precautions in regard to the disinfection or even change of the clothing worn. *Nine-tenths of all my cases were traceable to this cause.*

We have had no true Diphtheria, but many cases of a kind of gangrenous, putrid sore throat. I have seen two cases of Cerebro-Spinal Meningitis.

The only board of health here is the ordinary town board, which meets once a month; no special sanitary work has been done, and no expense incurred.

From HAMMOND; *Dr. E. L. Boothby:*— Diphtheria has been prevalent and severe in the village of Hersey, about fifteen miles east of this place, causing many deaths; it has seemed to be a renewal of the epidemic of last winter. Thus far there have been twenty cases and six deaths from the outbreak, which is not sub dued at the time of writing.

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I find the sanitary condition of the place very bad; there is not a well the water of which is not probably contaminated more or less by drainage from privy vaults. In one family where two very severe cases occurred I found the well within twenty feet of a deep, foul, privy vault, and such instances are very common.

I think that the local board of health has undoubtedly been delinquent in the performance of its duties.

From IRONTON; *Dr. E. J. Lewis:* — Quite a large number hereabouts need vaccination, and I have offered to do it at a merely nominal rate; I fear, however, that nothing short of a good Small Pox scare will make people do as they ought in the matter. The greater part of the adult population are probably protected, but very many of the children are not.

We have had some cases of Diphtheria, confined to a single family for the most part, and attributable I think to a foul condition of the cellar.

We have no board of health.

From KENOSHA; *Drs. S. R. McClellan and W. H. Saunders:* — We have lately had a visitation of Small Pox, which, however, came happily to an end, doing no very great amount of harm aside from that which always results from panic in a community. So far as can be learned it originated in a lad about fourteen years old, who came down with it on July 10th, after a visit of a few days to Chicago. The attending physician made an unfortunate error in his diagnosis of the case at the outset, and it was not until four other members of the family had been attacked that the true nature of the disease was recognized. By that time many persons had been exposed, having called and had free communication with the sick room, and it seems wonderful in view of such very general exposure that the disorder did not spread more widely. Five families in the city suffered from it, however, there being seventeen cases, two of which proved fatal; one patient died from exposure while being removed from one house to another; and one, a lady, was old and infirm when attacked, so that her death was almost a foregone conclusion. The remaining cases were mild in type and terminated favorably. But the first fatal case, the one referred to as dying

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from the results of exposure, was taken into a family living a few miles out of the city, in which there were seven children; nearly every member of this household was attacked and one died.

The excitement produced in our city by the occurrence of this outbreak has led to very general vaccination and re-vaccination. Owing to some bad results in years past there is a wide-spread prejudice here against the use of humanized virus, but against bovine virus there is none; hence it is probable that a law providing for compulsory vaccination would meet with general approval and support if the use of bovine virus only were prescribed.

The severity of the last winter affected the health of the city decidedly and unfavorably, and most cases of severe sickness had a marked tendency to assume a Typhoid character. Malaria, from which we have enjoyed great freedom for many years, has of late become more and more abundant, and during the past summer and fall cases of Malarial Fever have been frequent. Enteric disease is unknown here, but we have occasionally Typhoid forms of malarial disease — unusually often this fall — which in some few instances prove rapidly fatal.

Kenosha is proverbially a healthy city upon the whole, and we are sometimes apt to think that we can violate any and all sanitary laws with impunity. Our jail is in a wretched condition both as to drainage and ventilation, but there has been no serious disease in it notwithstanding the fact that it was filled with tramps last winter — often more than fifty being confined in it at one time! The general health of our city has improved since the introduction of artesian wells

There has been but little of either Diphtheria or Scarlet Fever, and the few cases that have occurred have been of mild type and have yielded readily to treatment.

By our charter the mayor is the chief health officer, and he with one alderman of each ward, five persons in all, constitute the board of health. During an epidemic the mayor is authorized to appoint a medical officer. No member of the board receives any compensation.

[N. B.— The cases of Small Pox spoken of in the above commu-

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nication occurred at a later date than any included in the tables elsewhere given, which come down only to May 31, 1881.]

From LEEDS; *Dr. J. Faerber:*— We have had during the year severe epidemics of Scarlet Fever and Diphtheria, in the course of which the effectiveness of strict isolation, as a preventive measure, was so conclusively shown that I think there will be little difficulty hereafter in enforcing it as a sanitary precaution whenever it may become needful here.

Scarlet Fever broke out first in a family who had been visiting in Portage, where the disease was then prevalent, but the members of the family in question claim that they did not knowingly expose themselves to the contagion. However this may have been, it is a fact that the disease was exceedingly virulent in type, as was evidenced by the first case, which ended fatally in twelve hours and before it was seen by any physician, the other children of the family attending school meanwhile as usual; four days later three of these children came down and then the true character of the malady became manifest. Steps were immediately taken to close the school and to isolate strictly all the sick, and all who were known to have been exposed; thus the disease was confined to four families in all—all of whom belonged to the district in which the first case appeared. Out of twenty-seven children belonging to these families, however, not one escaped an attack, and the teacher of the suspended school, going to his home, seven miles distant, infected his own family.

Diphtheria raged in the Norwegian settlement in this town, with a death-rate of thirty per cent. It infected house after house over a line four miles in length, in the course of three months, attacking only those of the above-mentioned nationality, who are somewhat clannish and mingle almost exclusively with each other. How the disease originated I do not know, but it was impartial in its visitations, the rich and poor, the clean and dirty, being all attacked alike.

From MANITOWOC; *Dr. R. K. Paine:*—I think that most of our people are careful to have their children vaccinated, though I have heard of some who oppose it from a fear of the introduction of

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some unknown disease into the system, and of others who claim that it affords no protection! Compulsory vaccination, even at public cost, I think would be vigorously resisted by many.

We have had much Diphtheria, and during March and April a good deal of Erysipelas, but I have seen nothing of the two diseases in combination. I had one case of Diphtheria in a child of six years old, in which after a violent attack of Diphtheria, preceded by Scarlet Fever, Typhoid symptoms developed themselves, and she died on the twenty-second day of her illness, completely exhausted. She was one of a large family of children but no other one of them has been sick.

There were quite a number of cases of injury caused by toy-pistols on or about the 4th July, but, so far as I am aware, no Tetanus resulted in any one of them.

We have a committee on sanitary matters appointed from the common council, who, with the city physician, constitute the only board of health we have; no sanitary work of any kind has been done, however, and the committee has no stated time for holding meetings.

From MERRILL; *Dr. J. F. Whiting:* — I should judge that not less than forty per cent. of the people of this county are unvaccinated — perhaps even as many as fifty per cent. I think, however, that, except possibly among some of the Germans, compulsory measures would be needless; all that is wanted probably is to have public attention fairly called to the matter.

There have been a good many serious cases of Choleraic Diarrhœa among children during the heated term, fatal in many instances. The water in our wells is not generally good, especially at present, having been affected by the heavy rains which have caused floods during two successive seasons. Several citizens are putting down drive wells, in the hope that thus they will secure a better water supply.

We had several cases of Cerebro-Spinal Meningitis during the cold weather of last winter, and in my opinion there has been a very general and decided increase in the amount of sickness hereabouts the causes of which are not far to seek; they are the late

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floods, the porous character of our soils, the deterioration of our water supply, the failure of our supervisors to appoint a health officer — they thinking that his duties can be efficiently performed by the ordinary police of the town! Such things and many others like them have combined to produce disease and consequent expense; lives and money might be saved annually, not here alone but in very many places all over the state, by a very little judicious expenditure upon matters which are now wholly neglected.

From MILWAUKEE; *Dr. G. D. Ladd:*— I have had two cases of Tetanus, both fatal, resulting from injuries caused by toy-pistols on or about the 4th July. Both were injuries to the hand, and in both, portions of cartridge were driven into the palm of the hand and between the metacarpal bones. Symptoms of Tetanus developed themselves, in one instance, in seven days, and in the other in ten days from the receipt of the injury. A third case of the same kind occurred within my knowledge at Waukesha.

From MUKWANAGO; *Dr. J. W. Cairncross:*— I think that about sixty per cent. of the inhabitants of this town are vaccinated; in my opinion there would be little or no objection to compulsory vaccination.

The town board acts as a board of health, but no sanitary work has been inaugurated in any direction. The health officer receives no compensation.

From NEW CASSEL; *Dr. L. Eidemiller:*— As regards the proportion of people protected by vaccination, I should judge that ninety per cent. have undergone the operation at one time or another in the course of their lives, but not more than ten per cent. of these apply for revaccination at any time. I think that compulsory vaccination at public expense would receive the support of a majority of the citizens in this vicinity. So far as voluntary protection of children is concerned my own experience is instructive. On two different occasions within the year I provided myself with a stock of good virus and announced that I would be prepared to vaccinate at certain specified convenient times; the result was that my virus spoiled on my hands before I had vaccinated patients enough to pay for even the quantity I used. Unless there is a

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thorough Small Pox scare people will give no attention whatever to the matter.

The only effect that I have observed as resulting from the severe cold weather of the last winter has been the apparent destruction of all miasmatic germs.

I have had one case of injury resulting from the use of a toy-pistol, but no tetanic symptoms supervened. I have had four cases of quasi-tetanic spasm, all of which occurred about the same time, in individuals of the same age, 14 to 16, but in widely separated localities; none of them resulted from any injury, however, and all recovered.

We have no health board although complaints of nuisances are frequently made to the chairman of the town board.

From OCONTO; *Dr. D. P. Moriarty:*— About ninety per cent. of our people are protected by vaccination. When compulsory vaccination was resorted to here, some three years ago, there was no opposition — it being done at public expense.

Erysipelas has not been a complication of other diseases, though it is by no means of infrequent occurrence; it can almost invariably be traced to prolonged exposure to dampness as in log-driving, in lumber camps, etc., etc.

The improvement in public health in this place is strongly marked, and is due, I think, to the introduction of the water from artesian wells as a general supply, and to better drainage; formerly Typhoid Fever was as common here as is Fever and Ague in the Saginaw marshes; now there are no endemic cases.

The only thing we have in the shape of a board of health is a committee consisting of three members of the common council appointed by the mayor, of which committee I am chairman. The special sanitary work done has been the visitation of all public buildings, the examination of all complaints and the urging of good drainage. No member of the committee receives any compensation and the whole expense is but a trifle.

From OSHKOSH; *Dr. G. M. Steele:*— I cannot give even approximately, the proportionate number of our citizens who are protected by vaccination; but there are certainly many hundreds who are

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not. My personal impression is that the public verdict would be in favor of compulsory vaccination — those unable to pay being protected at public expense. It is a rare thing in my experience to meet with any person of intelligence now-a-days who opposes vaccination, if done with bovine virus. President Albee of our Normal School has twice required the students in that institution to be vaccinated, and reports that there has been very little objection thereto on their part. Nothing short of compulsion will ever reach the case; very many among our foreign-born population *will not* be vaccinated unless they are compelled to.

Pneumonia was more frequent than usual during the spring months, and I attribute it to the severe weather of last winter. We have had no Small Pox, no Cerebro-Spinal Meningitis, and no Tetanus from any cause.

From REEDSBURG; *Dr. C. A. Rood:*— Not more than one-third of the residents throughout this section of country are properly protected by vaccination, and although I have tried to convince my patients and their families of the necessity of the operation, they are more alive to the present expense than to the future danger. I think, however, that no one would refuse vaccination either for himself or for his children if it were done at public expense.

From RICHLAND CENTER; *Dr. A. W. Bickford:*— I believe not more than one-half of our citizens are vaccinated, and that there would probably be considerable difficulty in enforcing compulsory vaccination.

Our board of health consists of the president of the village and six trustees; no special sanitary work has been done by the board this year except the indorsement of an order issued by the health officer directing the cleansing and disinfecting of privy vaults, cess-pools, pig-sties, stables, etc., and no money has been expended for sanitary purposes during the year. The health officer receives no compensation, except for medical services in the event of contagious disease among the poor, and then he has only the usual physician's fee for each visit.

From SEYMOUR; *Dr. W. H. Kerwin:*— Probably one-half of the residents of this district are protected by vaccination, but the general feeling is in favor of it.

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The only sanitary work done here has been the removal of a slaughter-house from the center of the city to its outer limits, and the occasional inspection thereof in the new location.

The health board consists of the city clerk and myself.

From SHAWANO; *Dr. J. D. W. Heath:*—I am unable to say to what extent the people here are protected by vaccination. Owing to some unfortunate accidents which occurred here in connection with it some six or seven years ago, and which excited considerable prejudice against it in the minds of the Germans, vaccination has not been practiced here to any great extent during that time. I think, notwithstanding these facts, that compulsory protection could be enforced here with comparatively little trouble.

We have had but little sickness during the past year, which I think is owing to two causes: 1st, the diseases that have prevailed of late years have been of the character which generally gives immunity from a second attack, and the susceptible material is for the present exhausted; and 2d, people are beginning to learn that they can avoid much sickness by obeying certain laws, and to act upon the knowledge to a limited extent. Our city is, moreover, in better sanitary condition than usual; many of the citizens are putting in drive wells to replace the old-fashioned curbed wells, and are cleaning up generally and disinfecting where it is needful.

One case of injury from toy-pistols has come under my observation, but neither Tetanus nor any other complication resulted therefrom.

No board of health has been organized this year.

From SHEBOYGAN FALLS; *Dr. C. B. Cody:*—Not more than one-half of the people are fully protected by vaccination. I think that the general sentiment would justify compulsory vaccination if done at public expense.

We have had a very large proportion of Diphtheria in this section during the year, and many cases proved fatal. I observed that the disease seemed to be influenced by the sudden and severe storms of last winter to a very considerable extent. It appeared to me that, the Diphtheria poison being in the air, a sudden cold affecting excretion and secretion often developed the disease. It

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was not confined to the village, but affected town and country alike and was equally fatal in both.

From SOLDIERS' GROVE; *Dr. J. Dinsdale:*— Disease hereabouts has been mainly malarial in character; our usual fevers have been more extended in their operation than for some years past, but hardly as severe. Whooping Cough has been prevalent and very severe; some three hundred cases occurred in this neighborhood. We have had also some Diphtheria, with Uræmia and Paralysis as sequelæ in a few cases.

Small Pox was brought here by an immigrant direct from Norway. The case was strictly isolated and fortunately the disease was prevented from spreading.

At the present time our fall fevers are beginning to develop; they are remittent in character and severe in type.

From STRONG'S PRAIRIE; *Dr. W. W. Worden:*— Not more than one-fourth of the residents in this vicinity are vaccinated. Public opinion would, I have no doubt, justify compulsory measures.

From SPARTA; *R. S. Wells, D. D. S.:*— In my judgment there are very many in this community, especially among the foreign-born citizens and the younger people, who are wholly unprotected by vaccination; there is little doubt that compulsory measures, more particularly as regards the children in our public schools, would meet with approval; certainly such measures would be favored by physicians and school officers, and probably our citizens generally would interpose no objection.

From SUPERIOR; *Dr. E. T. Ganneau:*— I believe that every one here has been vaccinated; I performed the operation myself in many cases last spring, at private cost and request in every instance. I strongly recommended action on the part of the supervisors but nothing was done.

Measles was brought here in the fall from Duluth, Minnesota, where it had prevailed for some time previously; I may say that every child in Superior had it, though in a tolerably mild form; I finally succeeded in having the schools closed, and the spread of the disorder was thus checked.

Our health board has hitherto held no formal sessions, and what

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service the health officer has rendered has been gratuitous. It is intended in the near future to issue a code of sanitary rules, and to look more closely after the general health of the community. Our town lacks a good water supply; at present our people make use of the water of the bay, which is frequently turbid and unfit either for drinking or culinary purposes. I doubt not a large amount of sickness comes from that source.

From UNION GROVE; *Dr. S. C. Buchan:*—I do not believe that one-third of the children in this vicinity who are under ten years old have been vaccinated, and probably a majority of the adults are also unprotected. It has been said that a nation is never so safe as when fully prepared for war, and applying the figure to attacks of disease, Small Pox more particularly, I can but regard the present condition of affairs here with alarm. Small Pox exists in several places with which the people hereabouts are in constant communication, and the dreadful disease may be brought here at any moment. I have tried to arouse the place to some sense of its danger, but have not succeeded even in getting my own patients to take any decided action; no one seems to realize that there is any particular risk. I have little doubt, however, that, were vaccination made compulsory, there would be no opposition to the enforcement of the law.

Toy-pistols are interdicted here altogether, hence there has been no accident resulting from them.

From VIROQUA; *Dr. H. A. Chase:*— Our citizens are very generally protected by vaccination, and I have no doubt that public sentiment would be largely in favor of compelling all to undergo the operation.

Pneumonia was very prevalent and fatal last winter, especially among older people, many of whom died in and around this place; a larger percentage of deaths occurred among those of advanced age than had been observed in an equal length of time for fourteen years.

We had no case of injury from the explosion of toy-pistols here, public opinion being strongly opposed to the sale, use or manufacture of those dangerous weapons.

Except as noted above, there has been no marked change in the

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character or amount of disease in this neighborhood during the past five years.

The local board of health consists of three members, two appointed by the president of the village from the board of trustees, with myself as health officer. The board meets daily during the late spring and early summer, until the village has been thoroughly inspected, manure piles have been removed, privies cleaned and disinfected, stagnant pools drained, and all sources of filth and disease removed; the board remains in constant session till all this is done. I cannot give the cost of all these measures, as they are carried out at expense of the individuals concerned; when the orders of the board in regard to the removal of a nuisance are neglected, or obedience to them is refused, the marshal receives directions to do the necessary work immediately, the cost thereof being charged up to the property on which it is done and collected with the taxes.

[An excellent method of working if efficiently carried out, and one that might be adopted throughout the state with advantage. There seems no good reason why the board should not hold stated meetings at regular intervals the year through in addition to the continuous session in the spring above described.]

From WAUSAU; *Dr. J. W. De Voe:* — About one-half of the people here are fully protected by vaccination, one-fourth partly protected, and the remainder are not protected at all. I think public sentiment would justify compulsory vaccination.

I have seen in all seven cases of Erysipelas occurring in combination with other diseases, five being instances of Scarlet Fever, and the remaining two of Diphtheria. In all of these cases, which were confined to two households, I found a bad water supply, and in one of them, badly ventilated rooms in addition thereto. The well in one place was in the back yard and received the drainage from barns and sinks.

Measles, Mumps and Cholera Infantum have been of frequent occurrence, but the fatal cases have been few, except when Measles has been complicated with Capillary Bronchitis. Cerebro-Spinal Meningitis was of frequent occurrence in this city and vicinity, and

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was very fatal in its effects. It began and ended with the extreme cold weather. I may remark in this connection that I have observed during the year an increase of many diseases affecting the Cerebro-Spinal and Glandular systems.

To the best of my judgment there has been an increased amount of sickness generally, which I am disposed to attribute to the extremes of temperature and sudden changes of weather during the year.

From WAVERLEY; *Dr. M. C. Thompson:* — Of all our citizens up to twenty-five years of age not more than ten per cent. have been vaccinated. The town authorities are wholly indifferent concerning the matter, but some action should be taken at once. It is quite true that we have no Small Pox here at present, but a case may easily be imported, and should such a thing occur the results would be disastrous in the extreme.

From WHITEWATER; *Dr. J. C. Salzman:* — We have had here a very considerable amount of sickness of various kinds, Diphtheria, Measles, Pneumonia, Influenza, Catarrhal difficulties and Cholera Infantum being included in the list.

Vaccination was performed here somewhat extensively last winter, especially among the American portion of our citizens. Personally I am decidedly in favor of compulsory vaccination when the matter is neglected; no child should ever be admitted to a public school who cannot show satisfactory evidence that the operation has been properly performed in his individual case.

We have no health officer and our sanitary condition is susceptible of great improvement.

From WILSON; *Dr. E. J. Baker:* — Diphtheria has been the only prevalent disease here, but it has been very malignant, having caused about one hundred deaths; at the time I write there are about ten cases.

I was appointed health officer, which post I still hold. My chief work has been the removal or disinfection of all offensive material and the keeping of Diphtheria patients isolated as far as practicable.

We have about come to the conclusion that bad drinking water

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Extracts from Special Correspondence.

is an important factor in keeping up the disease, and we send you herewith samples taken from ten wells in this place which we shall be glad to have you examine and report upon.

[The samples of water referred to above were entirely too small to admit of anything like a proper examination. So far as it could be done, however, analysis was made, with the result that six specimens out of the ten were considered decidedly bad, one was of very doubtful character, and the remaining three were probably fair average drinking waters, although it was thought that there were evidences of great lack of care in keeping the surroundings of the walls from which they were drawn free from all objectionable matters.]

[We give in connection with the above extracts from communications from professional men the following excerpts from notes appended to the annual reports made generally by clerks of local health boards, etc., which contain information of general interest. In deference to the general wish of these correspondents, only the names of the towns from which they come are given, the arrangement being alphabetical to facilitate reference. It is earnestly hoped that gentlemen holding these positions will feel free to communicate with the secretary's office in the fullest possible manner at any time.]

From AFTON:— Three cases of Diphtheria — all we have had here — occurred in one family, and were, I think, attributable to a damp, foul cellar and a generally unhealthy condition of the premises.

Scarlet Fever was confined to three families who lived in close contiguity to a low, damp tract of land, which, if it were not the original cause of the disease, certainly aggravated it materially. A year ago I reported a large amount of intermittent difficulties; this year we have had but very little.

Having kept a record of all deaths occurring during the year, I am able to make quite accurate returns.

[In all probability it is wholly within the power of a large number of clerks to keep such a record as that mentioned in the above note, and to ensure a very considerable degree of accuracy in it.

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Extracts from Special Correspondence.

The writer of the communication was not, we are glad to say, the only one who did so last year, as we received several reports to which were appended lists of all the deaths which had occurred during the twelve months, in some cases the ages of the decedents with the causes of death so far as known being also given. Such lists have a very considerable value, and were their numbers greater they would throw much light on the sanitary condition of the districts from which they come.]

From ALMON:— There are many people hereabouts who violate all laws of healthful living to such an extent that it is no wonder that sickness prevails among them. Uncleanly habits, dwellings that may more probably be called coops than houses (certainly they are not shanties), with floors laid directly on the ground with no joists under them, ceilings, or roofs rather, about eight feet in height at the front and sloping down to within three or four feet of the ground at the rear, with light admitted only through a single window composed of six panes, each eight inches by ten in area, with a hole dug in the middle of the single room to serve as a cellar, wherein potatoes, cabbages and turnips may be stored through the winter, with this hole rarely if ever cleaned at any time of year, with no way by which the foul effluvia may escape or fresh air enter, with interiors that never know the touch of a broom, with a pig pen in front of the house, the front wall of which forms one side of the pen, with a half-dozen of hogs, large and small, confined therein,— imagine the kind of life that must be led in such places, and you will not wonder that people sicken and die in them.

All these things I see daily, and worse things than these which I will not undertake to describe. If they were not so plentiful we should have fewer cases of disease, which unhappily does not confine itself to them. Diphtheria, for example, breaks out in one of these places, and the dwellers in all the others around it flock thither, to see and to help; they carry the disease home with them to their children, and soon a whole community is infected; then the better class of their neighbors are compelled by common humanity to look after them, and, whether from a lack of caution or

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Extracts from Special Correspondence.

lack of belief in its contagious character, the disease spreads to them also.

In a town to the north of us there have been about thirty deaths from Diphtheria during the last year, the victims being of all ages from two years old up to thirty, and in one instance at least, where the children of a family died, the disease was carried into another household by the careless giving away of infected clothing.

Our school houses, three in number, are in very bad condition; they are old log-buildings unprovided with either privies or fences, are wholly unfit for school purposes and have been in that condition for several years.

From ARKDALE:— In our town the dwellings are usually built on sand-hills, with the barns on the south side, the wells between the barns and the houses, and the privies on the opposite (north) side. The soil is sandy and porous, absorbing all the water that falls upon it, so that stagnant pools are never seen even in barn yards. The people generally are healthy and vigorous.

From BELLE PLAINE:— Diphtheria has been prevalent here now during a year. It broke out in this vicinity about three years ago, principally among foreigners, especially those who were not over-cleanly in their habits of living, but after it seemed to die out and we heard no more of it, about a year ago a man came here and opened a boarding house on the line of the railroad, leaving his family elsewhere. Soon after his arrival his son came here to call him home, where they were sick with Diphtheria; this lad must have been laboring under the disease in a very violent form, for he died the day after he reached this place, at his father's boarding-house. Only a few days after his death a number of Lutheran preachers came here, some accompanied by their families, and met at the boarding-house for the purpose of founding a seminary; a few days later still, Diphtheria declared itself among the children of the Lutheran preacher resident here, all of whom died, and from that one case, followed by the assemblage above mentioned, Diphtheria has been spread over a pretty wide area of country. Still there are people who tell us that it is not contagious!

[Multitudes of cases equally convincing are on record, and are

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Extracts from Special Correspondence.

constantly occurring — cases which establish beyond any possibility of doubt the exceedingly contagious nature of this disease; yet they pass unheeded, and Diphtheria is spread all over many communities, people meanwhile attributing it to some mysterious, atmospheric or other cause, failing to see what lies directly before them, and omitting the one simple and effective means of checking its frightful ravages.]

From BLACK BROOK:— Diphtheria has been the most prevalent and fatal disease hereabouts. As a rule those living in the timber and on low, swampy ground have been more affected than those living in the open, and on high land. The more fatal cases occurred also among those who were generally careless as to matters of personal and household cleanliness.

From COLUMBUS:— We have had few cases of Diphtheria, and those were confined to one family for the most part. Measles, however, had full swing among the school children during the winter, and there was not a school in the town but was either broken up or suffered severely from that disease; how it originated I cannot say; though the severity of the winter may have had something to do with it, *ill-ventilated school-rooms certainly took a part.*

As to the water supply there is nothing, I think, on which people are harder to move; the idea is so firmly fixed in many minds that it makes no difference what kind of water enters the ground, for it must be thoroughly filtered and rendered innocuous before it reaches the well. In a family living here, where the privy is in close proximity to the well, the people are neat and cleanly in their habits, and, were they once convinced that their water was tainted, they would not use it — but "the privy is down hill from the well, and the well is in limestone rock, and"— what more would you have?

[The relative positions of the tops of the privy-vault and the well are of no importance whatever in this matter. Suppose that the difference in level at the surface is ten or even twenty feet, and that the well is thirty feet deep while the depth of the privy vault is but five feet; is it not plain that the bottom of the vault will be

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five or fifteen feet above the bottom of the well, and that it may even be considerably above the level of the surface of the water in the well? And if, moreover — as is very probably the case,— the vault is dug down only to the surface of the underlying rock, while the well is drilled into the rock, is it not clear that there is a great probability that the water will be contaminated by infiltration of the contents of the vault into the well, and that this probability will become an absolute certainty in case the slope of the rock below the surface of the ground shall be from the privy toward the well? Such a question may be easily decided by throwing a quantity of salt into the privy vault and observing whether any effect is produced in the water of the well after the lapse of a few days. In regard to the supposed filtering powers of the soil, repeated experiment has shown it to be very small, and, in densely settled localities, equal to nothing. For a pretty full discussion of this matter reference may be had to the second annual report of this board, in which also are detailed Dr. Selden's experiments on the subject. The only safe plan is to remove the cess-pool, privy vault, and all similar nuisances as far as possible from the well.]

From DORCHESTER:— Our water supply in many cases is liable to contamination by the drainage from the cemetery, which lies on sloping ground, not above fifty rods from the village, directly towards which the water must run. Many of our people will not dig wells so long as the cemetery occupies its present location. Our resident physician mentions at least one case of disease as probably caused by water contaminated thus. The town board should move in the matter, as there are better locations for a cemetery available than the place in which ours lies at present.

[The town board, acting as a board of health, should take action in such a matter, and if the facts are as given above, should act very promptly in remedying the evil described. It is not probable that the number of bodies now interred in the cemetery is very large, but whether this be the case or not, they should at once be removed to some locality where they cannot endanger the health of the living. There can be no valid reason for prolonging the existence of a state of things such as that above described.]

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Extracts from Special Correspondence.

From ELBA:— About the middle of February last, a family resident in this town, in which were eight children, was attacked by Diphtheria; the oldest son, aged twenty-two, was the first taken sick, and died in two weeks; next a girl aged eight came down, dying in one week thereafter, and by this time all the children, with a single exception, were prostrated. *The one who escaped seldom entered the house.* The third victim was a daughter of nineteen who had been very active in the care of the sick, and in her case the disease seemed to be especially malignant, as she died only five days after being attacked. The fourth, and last fatal case, was that of a boy of fifteen; one-half of the entire family being thus swept away in six weeks' time. The origin of the disease is not known, but the contagion was probably imported.

Sickness in this vicinity has been greater in amount than ever known before. There is also a marked mortality among some farm animals, pigs and sheep suffering especially; of the former animals in some localities, eighty per cent. are either born dead or die within a few days after birth; the cause is unknown.

From ELKHORN:— I send you the best report that I can make, with full knowledge that it is far from being complete. Our physicians are averse to making report of any case of disease, whether the end be recovery or death.

From KENOSHA: — The health of our city has improved greatly since the introduction of a water supply from artesian wells, and with a better system of drainage, which will soon be introduced, further improvement is confidently looked for. Our city physician says that a large proportion of the sickness that has occurred during the last few years has been due to the bad drinking water in general use, and he predicts a steady diminution in all forms of disease henceforward.

From LUCK:— Some improvement has taken place in the sanitary condition of this town within the last two years.

Pneumonia and Diphtheria were the worst diseases with which we had to contend during the last winter; both were, in part at least, due to exposure in badly arranged houses.

People hereabouts are willing to have their children vaccinated,

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provided it is properly done by competent hands, but nearly all are afraid to allow the traveling class of physicians so-called, some of whom certainly are incompetent quacks, to perform that or any other operation. Is vaccination a safe thing for any one to do with or without experience, provided he is sure that he has good and healthy virus? In the part of the country from which I came we were all vaccinated as children and before we were old enough to know anything about the matter.

[Vaccination is an entirely safe operation so far as its subject is concerned; i. e., it is not at all probable that any disease will be introduced into the system or that any serious harm will follow the operation, no matter by whom it may be done, provided good and pure bovine virus be used. But to insure thorough protection against Small Pox it should be done by a physician who is well acquainted with the course of the vaccine eruption, and who can and will watch its effects carefully. Haste and carelessness are to be especially avoided; the instances in which the services of a skilled physician cannot be had must be comparatively very rare indeed.]

From MONROE: — I enclose statement made as correctly as possible under the circumstances, which are these: I entered on the work of collecting the statistics you called for with all the zeal and energy supposed to be possessed by a town clerk in his first year of office-holding. Immediately on the receipt of the blanks from your office I prepared forms for the physicians to fill out and sign, and sent one to every doctor in the place; on or about the 1st of May I called on them for the returns, but I have not met with that flattering measure of success to which a town clerk in search of information is supposed to be justly entitled!

Neither town nor village has any organized board of health, although one is much needed; if certain classes of contagious disease should make their appearance here we shall be found badly prepared to meet them. There are several nuisances hereabouts that need to be abated, and among other things, the board of health should prevent large assemblages at funerals where death has been caused by contagious disease. There is a large amount of sanitary work that might be done here were there any proper organization to do it.

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If you will send me a supply of your circulars on Diphtheria and other diseases I will distribute them to advantage, and will endeavor to co-operate with you in your work of bringing about a sanitary reform to the extent of my ability.

From NEENAH: — Were I to make a proper report it would be necessary to take a horse and buggy and a day's time to collect statistics. This would cost a sum that would bankrupt the town treasury — or at least would raise a greater outcry than would be caused by many heavier expenditures for much less important purposes.

The health laws of this state seem to me very imperfectly drawn, inasmuch as they allow the local *boards* to act or refrain from acting at their own good pleasure, while the *clerks* of the same boards are compelled under penalty to make returns which suppose an exact knowledge of the sanitary condition of the various towns throughout the year. Were the law so modified as to compel the *boards* to act, to meet once a month for example, and gather statistics, returns being also made by the people in case of sickness or death, the clerk would have some basis on which to work, and his reports would have a higher value than it is possible to give to them under existing circumstances.

From NEW HAVEN:—We have appointed no health officer in this town for the reason that we do not feel able to pay him. A very large proportion of the land is owned by railroad companies, who pay no taxes, so that the actual residents have a hard struggle to build school-houses, roads, bridges, etc., and to do all the work needful in the laying out of a comparatively new country. In a few years we hope that things will be otherwise; at present we do the best we can and work in good faith and with the best intentions.

From NORTH WISCONSIN JUNCTION:— There was more sickness during the whole of last winter ('80–'81) than I ever remember to have seen before, although our township was more fortunate than many neighboring ones. Our people generally take a great deal of care to prevent the spread of contagious disease.

We have no bogs or stagnant ponds from which to breed disease; our wells are from sixty to two hundred feet deep, many of them

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drilled through solid rock, so that it hardly seems possible that they can be badly contaminated by surface drainage. I think, moreover, that greater care is bestowed on matters of general cleanliness and of ventilation than is given in many farming communities.

The privy nuisance is found everywhere, however, and it is likely that it will be maintained yet for a long time to come.

From OTTER CREEK:— Concerning Diphtheria, I cannot tell the origin of all the cases, but it is very certain that a large proportion of them come from contact. There are very many people here who cannot be persuaded that Diphtheria is a contagious disease. I learn that one family who held this opinion were only convinced that it was wrong by the loss of four children in quick succession by means of it.

From PLEASANT PRAIRIE:— Farmers have suffered much loss during the past three months by reason of the death of many of their sheep; no one knows exactly the cause of the disease, though names for it are plenty.

Measles was spread through this vicinity by means of the district schools.

From PRINCETON: — It is not always easy to trace cases of disease to their true causes, whether local or otherwise, but it is safe to say that very much of it arises from unhealthy conditions of living on the part of some, more especially those of certain European nationalities; for instance, there are cases hereabouts where a man, his wife, and from six to eight children may be found, all huddled together in a single room, of very limited dimensions too, which serves as kitchen, dining-room, sitting-room, bed-room, scullery, and every other kind of room, and which has, withal, no other means of ventilation than the outside door!

Through the whole siege of Diphtheria now just about ended here, the greater number of fatal cases have been found occurring in just such places as those described; no doubt the filthy habits and unwholesome food usually attendant on such a way of life had their influence. There have been cases in town where all the children in a family, from five to seven in number, have died, but the people have at last learned to dread the disease as contagious and to take greater care not to expose themselves, than formerly.

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Probably the greatest dangers to health in this neighborhood are the filthy state of back streets, alleys, privies and yards, with the habit above-mentioned of living in overcrowded and unventilated rooms.

From RIPON: — Our town board has never organized as a board of health, although the city of Ripon, included in our limits, has an organization of that kind. Many cases of fever can be traced very clearly to the use of contaminated water; in two cases I personally recommended the closing of wells, and the digging of new ones further from a source of impurity.

There has been an unusual mortality among the sheep in this town, the loss, I should judge, being twenty per cent. of the whole number. Some farmers call the difficulty "grub in the head," but I think it was probably largely due to the extreme cold of last winter and the difficulty the animals found in procuring sufficient and proper food.

From WAUPUN: — During the past year attention has been given to the water supply, and many drilled wells have been sunk and reamed for a depth of twenty feet, in order to prevent the possibility of contamination by surface drainage, infiltration from the prison sewer or from privies. Our greatest danger comes from these sources. Some attention has been paid to the drilling of artesian wells, and it is thought that the St. Peters sandstone has been struck in two instances at least.

From WAYNE: — There has been a very severe and fatal form of disease prevalent among swine in this vicinity; some call it Hog Cholera, but its manifestations differ so widely in different individuals that I hardly know what to call it. Death follows in some cases immediately on the attack, while in others the animals linger for five or six months; none that are attacked, however, recover. Whatever it may be, it came hither from the southwest; in the town of Addison it has been more widely spread than here.

I have had a somewhat remarkable experience with it; I had three sows which were in the sixteenth week of gestation; all three aborted; every one of the pigs, twenty-three in number, died within two days with evidences of the above described disease, but

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Extracts from Special Correspondence.

the sows seemed nothing the worse, and are living now in good condition.

From WILSON:— Our town is suffering under Diphtheria and has been for some time past. Our board of health appointed a health officer in the spring, who has been doing what he could to check the spread of the disease, and with some measure of success, but it seems very obstinate and of pretty malignant type. The doctors suspect that bad drinking water has something to do with causing it. In the village of Hersey, where most of the cases now are, the land is low and the drainage is consequently very poor.

From YORK:— No. 1. We are blessed with a healthy locality, and most of the residents therein have sufficient common sense to avoid digging a well and a privy close together, and to avoid living over a cellar full of stagnant water. Our town officers, too, generally see to the prompt removal of nuisances. Still there has been a good deal of sickness that might have been avoided.

From YORK:— No. 2.[1] Last fall an epidemic Diarrhœa prevailed, which seemed to be contagious, very decidedly so, in its character; pretty much every one who came in contact with it contracted it, adults and children alike, and was laid up with it for a week or more. In the spring following, almost every one suffered from an influenza, which resembled greatly the Epizootic in horses.

[1] These two communications are not from the same town, as might be inferred from the name.

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SEVENTH ANNUAL REPORT

OF THE

STATE BOARD OF HEALTH

OF

WISCONSIN.

1882.

MADISON, WIS.:
DEMOCRAT PRINTING CO., STATE PRINTERS.
1883.

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J. T. REEVE, M. D., SECRETARY.

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The attention of the public, and especially the attention of physicians, and of officers of towns, cities and villages, is invited to the following law, enacted by the legislature of 1883.

CHAPTER 167.

AN ACT for the better protection of public health.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. Every town board, village board or common council of every town, village or city in this state shall hereafter, within thirty days after each annual election, organize themselves into a board of health, or shall appoint from their own members a suitable number of competent persons, who shall organize by the election of a chairman and clerk, and exercise all the powers and perform all the duties of a board of health for such town, village or city, as defined in the revised statutes, and every board of health shall, within ten days after being organized as above specified, appoint a competent and proper person who shall be, whenever the same is practicable, a reputable physician, who shall be the health physician and health officer of the town, village or city, and who shall hold office during the pleasure of the board, and until his successor shall have been duly appointed and qualified; and in case of the occurrence of a vacancy by reason of the death, resignation, removal or refusal to serve, of any such health officer, the board of health shall within twenty days thereafter, fill such vacancy by making a new appointment, as herein provided, and immediately upon the appointment of any health officer as herein provided, the board of health making the same shall transmit to the office of the state board of health the name and postoffice address of the health officer so appointed; and all health officers, appointed under the provisions of this act, shall be ex-officio members and executive officers of the boards by whom they are appointed; provided, that this section shall not apply to any town, village or city which by its act of incorporation, or amendment thereto, shall have provided for the appointment of a health board and a health officer.

SECTION 2. It shall be the duty of every health officer, appointed under the provisions of this act, or by the provisions of special charters, upon the appearance of small pox, diphtheria, scarlet fever, Asiatic cholera, or other dangerous contagious disease in the town, village or city under his supervision, immediately to investigate all the circumstances attendant upon the appearance of such disease, and to make full report thereof to the board of which he is the executive officer, and also to the state board of health, and it shall be the duty of such health officer at all times promptly to take such measures for the prevention, suppression and control of the diseases herein named, as may in his judgment be needful and proper, subject to the approval of the board of which he is a member, and it shall be the duty of every health officer to keep and transmit to his successor in office a record of all his official acts; and the salary or other compensation to be paid to every health officer appointed under the provisions of this act shall be established by the board of health by whom such officer shall be appointed.

Section 3. Whenever any such physician, residing and practicing in the

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state, shall know that any person whom he shall be called upon to visit is sick with small-pox, scarlet fever, diphtheria, Asiatic cholera, or other dangerous contagious disease, he shall immediately give notice thereof to the board of health of the town, village or city in which such sick person shall be at the time, and any physician who shall refuse or neglect to give such notice for a period of forty-eight hours shall, on conviction thereof, be liable to a penalty of not less than five nor more than twenty-five dollars, for each day of such refusal or neglect after the expiration of said forty-eight hours; provided that the notices herein required may be sent by mail, or except in the case of cities may be given to or left at the residence of any member of the board of health, and notices so mailed or given within the time specified shall be deemed a compliance with the provisions of this section.

Section 4. All expenses incurred in carrying out the provisions of this act, or any of them, shall be paid by the town, village or city by which, or on behalf of which, such expenses shall have been incurred.

Section 5. Upon complaint made in writing under oath by any citizen of the state, before any magistrate or justice of the peace, charging the commission of an offence against any of the provisions of this act in his county, it shall be the duty of the district attorney to prosecute the offender, and all sums recovered under the provisions of this act shall be for the benefit of the school fund.

Section 6. This act shall take effect and be in force from and after its passage and publication, and all acts and parts of acts conflicting with the provisions of this act, in so far as they contravene the same, are hereby repealed.

Approved March 27, 1883. Published March 31, 1883.

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GENERAL REPORT OF THE BOARD.

OFFICE OF THE STATE BOARD OF HEALTH
OF WISCONSIN, October 31, 1882.

To his Excellency, HON. J. M. RUSK,
Governor of Wisconsin;

Sir: — In accordance with the provisions of the law under which the State Board of Health is organized, the following, its seventh annual report, is respectfully submitted:

For a full account of much of the practical work done under the auspices of the Board, reference is made to the report of the secretary of the Board, submitted herewith. This report gives, with some detail and with statistical tables, as complete an account as it was practicable to make of the chief zymotic diseases and of some others that have prevailed in the state during the year. In particular, there is given a detailed history of the epidemic of Small Pox from which the state has suffered within that time, the disease making its appearance soon after the date of our last report.

This epidemic was foreseen by this Board as probably inevitable, owing to the large number of unvaccinated persons in the state, and the frequent communication of our citizens with places where the disease was known to exist, and, so far as was possible, it was guarded against by the issue of repeated circulars of warning to our citizens to protect themselves from threatened danger, and of instruction for the control and management of the disease, should it unfortunately be brought to them. For this purpose also, prior to the appearance of a single case of the malady in any part of Wisconsin, communication was opened with Local Health Boards and Health Officers generally throughout the

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State, and all possible arrangements were made to insure an early knowledge of any outbreak of Small Pox that might occur in Wisconsin, to the end that the Board might co-operate intelligently and to the extent of its powers with the local authorities in case of need. Heads of educational institutions were also advised of the threatened danger, and urged to use their influence in causing proper preventive measures to be adopted by those under their charge.

It is with no small degree of satisfaction that this Board has received the assurance that these efforts have contributed to prevent Small Pox from obtaining a foothold at all in many places, and to its control within very circumscribed limits in others, and that upon the whole, Wisconsin has suffered lightly in comparison with other states from the visitations of this loathsome disease.

We invite attention to the detailed account of the disorder given in connection with the secretary's report, as showing in many repeated instances that Small Pox is really one of the most readily controlled of all zymotic diseases. This report shows in such numerous cases the controlling power of vaccination, that it may seriously be questioned whether it be not the duty of the state at least to limit its educational privileges to those who, having successfully undergone this operation, are not in themselves continual sources of danger to others, as are the unvaccinated. That there are prejudices against vaccination, especially among certain of our foreign born citizens, we are fully aware, but careful examination of the opinions of a very large number of the physicians of this state, as given in the secretary's report, will show that not one of them has ever personally known disease or serious injury to result from it. This testimony from so many well-known and competent observers merits careful examination and is especially commended to your attention. We believe that the following terse statement from the London Lancet is fully justified: "One case of Small Pox in a com-

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munity, uncontrolled by medical science, would work results, compared with which the effects of an irregular or careless vaccination would be a mere flea-bite."

In view of the facts shown by the late epidemic and detailed in this report, this Board recommends such legislation as will make successful vaccination a pre-requisite to admission to any public school of the state. An effort was made at the last session of the legislature to secure this result; had the measure been successful it is probable that there would to-day be few unvaccinated persons in attendance upon the schools, and that one great source of danger would thus have been permanently removed from our midst.

Another point to which we desire to call attention in connection with this history, is the frequency with which Small Pox has been brought to the state by foreigners who brought with them the germs of the disease, contracted before leaving Europe, or *en route*, which developed in contagious shape, occasionally even in public conveyances, but more frequently immediately after arrival at the new home to which they thus introduced disease and death. Such new comers frequently have exalted ideas of personal liberty, but "the liberty to disseminate disease is the one of all liberties that common interest demands should be put under complete control."*

Situated as Wisconsin is, it has not seemed necessary or wise for this Board to enter into any systematic surveillance of the emigrants coming into it, *en route*, but in other states, so situated as to be more exposed to danger from this source, excellent service has been done by Health Boards, acting under the auspices of the National Board of Health, in the sanitary inspection of all emigrants passing through them. It is eminently desirable that such service be maintained and that the powers of the National Board be enlarged.

*Martin; before the Royal Academy of Belgium.

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But though Small Pox has attracted the most of public attention during the year,

DIPHTHERIA

has, as in past years, been productive of much greater suffering and loss of life in the aggregate. We are however, happy to note that this disease has greatly diminished during the year, and it is earnestly to be hoped that, with such better knowledge of its contagious character and of the means by which it may be controlled as we now possess, it may never again attain the height it has reached in this state in former years.

These remarks are equally true of

SCARLET FEVER.

These two diseases have for several years past been most heavily destructive of child-life, and the percentage of decrease of each during the past year has been quite remarkable and highly gratifying.

TYPHOID FEVER

on the other hand nas notably increased, and this increase, which has been steady during the past four or five years, is one that calls for an earnest effort to search out and remove the cause. Attacking, as this disease usually does, those in the most vigorous period of life, its presence with increasing frequency causes anxiety and forms a drain upon the best resources of the state that is heavily felt. We commend the pages devoted to this subject in the secretary's report to careful consideration, as well as those there occupied by the discussion of other diseases not here enumerated.

Taken as a whole, it will be seen from this Report that, notwithstanding the excitement produced by the presence of Small Pox, the

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General Report of the Board.

GENERAL HEALTH OF THE STATE

has been unusually good, and that not only Diphtheria and Scarlet Fever, but also Diarrhœal and Dysenteric disorders, Malarial diseases, Cerebro-Spinal Meningitis and pulmonary diseases generally, have been less in amount than during previous years of the Board's history.

Upon these facts the people of the state are to be congratulated. With proper attention to the rules of healthful living, which it is the object of state medicine to inculcate, and the importance of which the people of Wisconsin are, as a whole, quick to perceive, there seems no good reason why the State should not maintain the high standing to which its soil, climate and situation entitle it, as one of the most healthful spots upon the earth.

Societies and clubs organized for various purposes are to be found in almost every town and village within our borders; prominent among them, and truly regarded as indicating the advancement of humanity in our time, are societies for the prevention of cruelty to animals, for aiding children, for the study of various social problems, for taking care of the convict as he leaves the prison cell, helping him to stand upon his feet, and in striving to regain the respect of his fellow-men; it would almost seem as if, the lower down in the scale the more certain is the man who has sunk to find some association expressly organized to meet his special wants. But the societies founded upon such plans as those suggested by Dr. Bingham in our last report, which shall study the conditions of daily and hourly life, the art of building houses that shall be really well planned, well lighted, well warmed, well ventilated, thoroughly healthy places in which to live, the associations that shall study the science of family and individual sanitation, how best to prevent the entrance of disease into the home, how best to guard against its spread, not only amongst the members of the household, into which it may unhappily find its way,

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but among the members of the community of which the household forms a part, how to care for the victims of sickness or of accident with all the tenderness and assiduity that their condition demands, while yet a due regard is had for the welfare of the attendants, the societies that shall study all these and many more subjects of equally vital importance, are not yet formed.

Here and there, chiefly in New England towns, we hear of the formation of Sanitary Protective Associations, organizations which have much to recommend them, and which aim to do a part of the work outlined. We trust that the people of Wisconsin, who have not hitherto been among the slow to take an advanced position in matters relating to the public welfare, will soon move in this direction also; the health of individuals, and as a consequence that of the State as a whole cannot fail to be benefited by such movements.

SPECIAL WORK OF THE BOARD.

In addition to the general work of the Board already alluded to, it has been called upon to make an investigation into the causes of an outbreak of Diphtheria, which was supposed to have been produced by the vicinity of certain overflowed lands devoted to the cultivation of cranberries. In this inquiry the Board availed itself of the services of one of its correspondents in the immediate vicinity of the land in question, Dr. N. M. Dodson, with whom were associated Dr. J. S. Walbridge and Dr. J. M. Dodson, also residents of the neighborhood; the intimate knowledge of the ground and the people possessed by these gentlemen, enabled them to obtain facts that no visiting committee without such acquaintance could possibly have learned, and to reach conclusions which the Board regards as eminently sound. From their report, based upon careful and thorough research and examination of the district complained of, and strengthened by a comparison of the statistics of disease in

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the neighboring townships, it seems evident that the causation of Diphtheria in this locality must be assigned to some source other than the existence of the cranberry marshes and their periodical overflow. The table given does not show any marked increase either in the number of cases or in the fatality at the time when the water is drawn off from the marshes, and when, if the disease were due to the decay of vegetation thus left exposed, such an increase might reasonably be looked for — rather the reverse. But such an increase *is* noticeable in each year at about the time when picking begins, and many persons are gathered upon the marshes from all quarters, bringing with them clothing and bedding of various kinds. From such a congregation, embracing those of all habits, from the most cleanly to the most careless, those who have never known what sickness means, and those who have just barely recovered from some form of disease, and who look to the open air employment and moderate exercise as a means of recuperation, the spread of contagion, if any exist, may not only be looked for but may be predicted with a tolerable degree of certainty. There is hardly room for doubt that the conclusions at which Drs. Dodson and Walbridge have arrived, are eminently sound.

Their report, which is presented in connection with that of the secretary, illustrates anew the necessity for precautions to prevent the spread of contagious disease the importance of which this Board has constantly endeavored to impress upon the people of our state.

The Board through a committee, has also, at the request of your excellency, made a sanitary investigation of the sewer of the State Prison at Waupun, a similar request having been likewise made by the Local Board of Health of that city. A report of the result of this examination has already been made to you, and a copy thereof, together with a copy of a special communication made to the Local Board

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of Health of Waupun, is given in connection with the Secretary's Report.

SPECIAL PAPERS.

In addition to the papers already referred to there are also presented herewith some that have been prepared at the request of the Board upon subjects of sanitary interest. One of these is a report upon an

ENDEMIC OF TYPHOID PNEUMONIA,

prepared by Dr. S. B. Hubbell of Medford. Though this outbreak was limited in extent and circumscribed in the area over which it prevailed, it illustrates in a very striking way the influence of unsanitary habits and surroundings upon the malignancy of disease, and from these circumstances this brief paper possesses an interest and a value greater than many more pretentious and voluminous documents. The rise and progress of the pestilence are clearly traced, and its origin in the filth-pollution of the soil and water is clearly proven. We trust that the paper will be read with the care and attention that its importance deserves.

A second paper from the pen of Prof. W. A. Henry, of the State University, gives a method whereby the dangers of such outbreaks may be largely diminished, if not wholly avoided, while at the same time, the risk attendant on exposure to cold and disagreeable weather while responding to the calls of nature, so dreaded by many persons, especially by women and delicate children, may be entirely done away with. The simple and inexpensive arrangement described by Prof. Henry, is available and practicable almost everywhere, and, unlike many arrangements for the same purpose, it has the great advantage of having been tested by actual use.

Prof. Peckham contributes some further tables in connection with, and in continuation of the work begun by him under the auspices of this board; the tables prepared by Prof. Peckham and published in our last report have at-

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tracted much notice and commendation from both sanitarians and physiologists in various parts of the country. They furnish material which, while not of a popular character, is valuable for purposes of study, and the obtaining of which requires an amount of labor, which is not often performed, and a perseverance and patience not very common.

Dr. K. Hoegh contributes a paper upon

THE HYGIENE AND DIETETICS OF INFANCY,

which is worthy of careful perusal. Dr. Hoegh has endeavored, not so much to cover new ground as to make plain and clear to the popular understanding, truths that are accepted by all intelligent physicians. In so doing he has however allowed himself a somewhat wider range than is customary, and has given attention to the well-being of the parent as involving primarily that of the child. The subject of artificial feeding also is considered, and some unwise practices on the part of nurses and midwives in their treatment of children are mentioned and condemned.

Prof. Chittenden, who has contributed several papers to previous reports, has furnished an article upon

NOSTRUMS,

in which the results of analyses of many of these compositions are given, and the methods used to secure their sale discussed. There is little room for doubt that if the public could once be made fully aware of the true character of many compounds sold and largely used for the cure of disease, and could be made to comprehend the fact that those which are innocent are worthless, while those which produce any effect do so by the agency of potent drugs, such as corrosive sublimate, aconite, morphine, arsenic, etc., the presence of which is concealed under some delusive name, the gains of their proprietors would soon be greatly decreased, and there would be some hope that they would betake themselves to some way of money-getting less injuri-

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ous to their fellow citizens. In addition to these papers very much matter of general or local interest will be found in the

EXTRACTS FROM SPECIAL CORRESPONDENCE,

and from reports of Local Boards published in connection herewith. It is a most gratifying proof of the interest taken, not only by the medical profession, but by others in the work of this Board, that the material thus furnished has constantly increased in amount and in value since the publication of our first report. While, at the beginning, physicians only, favored us with any communications, we are now in frequent receipt of reports from the clerks of Local Boards, from school authorities and others, giving information in regard to sanitary matters of general or local interest, and very rarely indeed is the request made that such information be suppressed. It happens occasionally that a writer desires that the names of persons, or more rarely of localities shall not be mentioned, but even such communications are always guaranteed by the writer's own name and full address.

The extracts given are published without reference to whether the opinions expressed by our correspondents agree with those held by the Board on the subjects discussed or not, the object being to encourage the freest interchange of opinion upon all subjects properly within the scope of the Board's work.

To the correspondents of the Board, both in Wisconsin and elsewhere, we have been greatly indebted for valuable information at many times during the year. Our relations with other State Boards have been cordial, and we have been indebted to their executives for a free exchange of reports, circulars, and other documents, many of which contain matter of great value from a sanitary point of view.

REGISTRATION.

The importance of a correct system of registration of vital

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statistics is a matter which still engages the attention of the Board, but much yet remains to be done before Wisconsin can claim that anything worthy of the name exists for her. Every marriage demands careful authentication upon public official records, as does also every birth and death, while a formal permit for burial should in all cases be required, in order that no death should be allowed to occur without such record, and without a certification of the cause of such death.

A part of the machinery needed for such system has been in existence in Wisconsin for many years, but further legislation is needed before that which exists can be made of any public value as a system of vital statistics, and the benefits derived from registration as now practiced are such only as accrue to the individuals concerned in the imperfect records now kept.

Among the many gratifying evidences of the growing interest in matters pertaining to sanitation, we have great pleasure in calling attention to the work done by the late incumbent of the State Superintendency, Hon. W. C. Whitford. This gentleman in his last report has embodied a series of plans for school-houses of different grades, in which careful attention has been given to matters of proper lighting, heating and ventilation. While it cannot be said that these plans reach the highest ideal of the sanitarian, they are still so far in advance of the plans used in too many buildings all over the state, that we heartily commend them to the consideration of school authorities throughout Wisconsin, especially those who contemplate either the erection of new buildings or the remodelling of old ones, for which latter proceeding many useful suggestions may be drawn from the plans in question. It is an ungracious task to criticise such a work, but it should be said that in some of the larger buildings, as drawn, the architects have not allowed sufficient floor space, and have tolerated the vicious systems of attaching seats to the desks behind them, and of

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double desks, two features originally introduced directly in the interests of over-crowding. For these errors, which may readily be avoided in the furnishing of any school-room, the draughtsmen only are responsible. Mr. Whitford has left as a monument of his official term a report which has thus far never been surpassed in its practical value.

Another evidence of the growing care for the welfare of the children we find in one of the acts of the last legislature. In our last report reference was made at some length to the dangers of the toy pistols at that time so frequently used by children. That these dangers were not overstated is proven by the numerous reports of accidents resulting from these deadly playthings, which have occurred in other states since then, and which many physicians and surgeons of Wisconsin have been called upon to treat. We are happy to say that the attention of the legislature having been called to this danger, both the sale and use of such weapons have been interdicted in Wisconsin. The following is the text of the law:

AN ACT to prohibit the sale or use of toy pistols and other firearms.

The People of the State of Wisconsin, represented in Senate and Assembly, do enact as follows:

Section 1. It shall be unlawful for any person to sell or use, or to have in his possession for the purpose of exposing for sale or use, any toy pistol, toy revolver or other toy firearm.

Section 2. Any person violating any of the provisions of this act, on conviction thereof, shall be punished by imprisonment in the county jail not exceeding six months, or by a fine not exceeding one hundred dollars, or by both fine and imprisonment in the discretion of the court.

Section 3. This act shall take effect and be in force ninety days after its passage and publication.

This act was approved by the Governor March 18, 1882, and published three days latter, thus taking effect June 18, 1882, just in time to stop the sale, which would otherwise have commenced about that date, of the dangerous toys that

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had caused so much suffering and so many deaths among promising children.

In conclusion, it is proper that reference should be made to the loss sustained by the Board in the retirement of two of its original members, namely, Dr. Favill at the expiration of his term of office in February last, and Dr. Griffin, by resignation in August. The vacancy caused by the retirement of Dr. Favill was filled by the appointment of Dr. Knut Hoegh of La Crosse—that caused by Dr. Griffin's resignation yet remains unfilled.*

As Dr. Griffin from the organization of the Board by the continuous choice of his associates had filled with great acceptance the office of president, in which he had largely contributed to the success of the Board, it seemed fitting that the Board should place on record some testimonial expressive of the loss sustained not only by the Board but by the state, by reason of his retirement. The resolutions adopted by the Board on the occasion will be found in the secretary's report.

The vacancy in the office of President caused by Dr. Griffin's resignation was filled by the unanimous election of Dr. S. Marks for the remainder of the term.

Finally, the Board returns its thanks to your excellency for the interest in its work manifested by you; it also returns thanks to the large and increasing number of men and women throughout the State who have co-operated with it in the work committed to its hands.

It is gratifying to know, as we do, that notwithstanding the existence of many unsanitary conditions, the average length of human life is steadily increasing throughout the civilized world. It is the grand mission of Health Boards to point out how disease may be prevented, how suffering from that which is inevitable may be ameliorated and how

* It has since been filled very acceptably by the appointment of Prof. W. W. Daniells, of the State University at Madison.

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life may be still further prolonged. In such work we invoke the aid and co-operation of all well-wishers to humanity.

SOLON MARKS, M. D.,
JAMES BINTLIFF,
G. F. WITTER, M. D.,
H. P. STRONG, M. D.,
KNUT HOEGH, M. D.,
J. T. REEVE, M. D.,
State Board of Health.

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Secretary's Report.

SECRETARY'S REPORT.

To the Board of Health and Vital Statistics of the State of Wisconsin:

GENTLEMEN:—I have the honor to present the following, my seventh annual report as your secretary and executive officer, for the year ending October 31, 1882:

Since the date of my last annual report to you, there have been some important changes in the constitution of the Board, two of its original members having retired from it, viz: Dr. J. Favill, at the expiration of his term of office in February last, and at a later date Dr. E. L. Griffin, who, since the organization of the Board, and until the date of his resignation, had served continuously as its president.

The probability that this resignation would be made at some time during the year, was intimated to you at the annual meeting in January last, Dr. Griffin having stated in a communication presented to you at that time, that the pressure of his private business was so great as to require his whole time, and having desired then to retire from the presidency of the Board. His re-election to that position, however, was unanimous, and he accordingly continued to serve until at a special meeting of the Board, held at Madison, August 9 and 10, at which all the members but himself were present, the following communication was received from him:

WISCONSIN STATE BOARD OF HEALTH,
Office of the President,
FOND DU LAC, August 9, 1882.

To the members of the Wisconsin State Board of Health:

GENTLEMEN:— The demands of private interests have compelled me to resign my commission as a member of the Wisconsin State Board of Health.

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Secretary's Report.

I herewith resign the office of President of the Board, which office, through your courtesy and by your repeated action, I have held during the entire period of the Board's existence.

I cannot thus voluntarily surrender my official connection with you, without making some expression of my feeling of personal obligation to each member for the consideration and courtesy that I have received, or without the assurance that this severing of my legal relations to the Board, will not in the least diminish my interest in the health service of the state.

The work accomplished by this department during the past seven years may appear small to some, but it will seem so only to those who fail impartially to survey the field that has been opened, and the nature of the service which has been rendered. It is doubtful whether an equal amount of the public funds has been expended during the time of the Board's existence, for a wiser purpose, or in a way more manifestly for the benefit of the state. It is not always the more demonstrative or the more actively aggressive measures that are of the greatest advantage, whether to the individual, the family, or the state; it is rather the more silent agencies that quicken thought, lead to self-culture and tend to aspirations after things higher, purer, cleaner, and better in human life.

In this direction you have accomplished much; you have not aimed to introduce radical and boldly aggressive measures, but your work has been educational and suggestive, touching the things that lie close to the welfare and safety of the individual and the family.

Entering upon the labor at a time when there was not much of precedent to guide you, and when the public mind was to a great extent ignorant of and indifferent to the beneficent ends sought, you have already created a public sentiment in this state which is appreciative of your work, which gives you moral support and which would enter a strong protest against any retrograde movement.

Nor has the influence of your efforts been confined to our own state. Your annual reports have been received as authority on health matters by other State Boards of Health, and prominent sanitarians everywhere have commended your work as practical, suggestive, and worthy of imitation by others.

I need not remind you of the rapid progress that is now being made toward the discovery of the *primary cause* of contagious diseases. The great stimulus given to these investigations comes from the general interest in Preventive Medicine. It is not too much to hope and expect that in the near future, Sanitary Science will be able to demonstrate to the public the primary cause of nearly if not quite all of the zymotic diseases, and to apply an efficient destructive agent to each one.

With this inviting field of sanitary research before you, with lines of useful work already gathered up, and with a people waiting expectantly

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for your suggestions, you represent an interest in the state second to none in its value to our commonwealth. Esteeming it an honor to have been associated with you in the initiation of such a work, I shall continue to cherish a warm interest in it, and in those who may be privileged to carry it on to its possible results. Respectfully yours,

E. L. GRIFFIN.

The resignation of Dr. Griffin tendered in the foregoing communication was accepted, and Gen. Bintliff was appointed a special committee to draft and report suitable resolutions, expressive of the appreciation of the Board of the faithful and efficient service rendered by Dr. Griffin during his presidency.

The following is the report of the special committee (presented at a subsequent meeting), and which was unanimously adopted as the sense of the Board:

WHEREAS, Dr. E. L. Griffin, one of the original members of this Board, and its President, by the unanimous choice of his associates from the date of its organization, has resigned his office as President and his membership in this Board; and,

WHEREAS, It is fitting and proper that we should place on record some expression of our loss and our appreciation of the invaluable services rendered by Dr. Griffin to the cause of Sanitary Science, and to the people of this state; and,

WHEREAS, Commanding as he has done the confidence of the medical profession, and being in this field of effort a worthy representative of its best thought, he has given liberally of his ripe experience and mature judgment to create in the public mind the conviction, by disseminating the knowledge upon which that conviction may securely rest, that the medical faculty might be more properly employed in teaching the people how to live so as to avoid disease, than in attempting to parry the blows which nature inflicts as the penalty of violated laws. Long after our labors in this life shall have ended, the brief, but comprehensive address delivered by Dr. Griffin upon the organization of this Board, will be read with profit by those who shall succed us in the work of completing the demonstration that "sanitary and economic science are inseparable in a wise administration of civil-government." No more beneficent work can be presented to the intelligently philanthropic, than to assist in preparing the way for that evolution of thought, which shall comprehend how fully the physical salvation of the race from a long list of diseases now prevalent, is within the

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reach of all who will live cleanly, temperate and well-ordered lives. In this branch of educational effort Dr. Griffin has justly earned for himself a national reputation; therefore,

Resolved, That in the retirement of our late president we feel deeply sensible of the loss we have personally suffered, and of the greater loss experienced by a cause, the principal object of which is, "to enlighten the public mind as to the nature and causation of diseases and the means of their prevention."

Resolved, That in the intelligent, conscientious and thoughtful work done by Dr. Griffin during the years in which he directed the activities of this board, we recognize a fitting memorial of his worth as a citizen, as a sanitarian, as a distinguished member of the medical profession, and as a pioneer in our state in the beneficent labor of giving to the people a broader knowledge of the laws of life.

The vacancy in the office of president caused by the resignation of Dr. Griffin was filled by the unanimous election of Dr. Marks to that office.

The vacancy caused by the retirement of Dr. Favill was filled by the appointment of Dr. Knut Hoegh of La Crosse; that caused by the resignation of Dr. Griffin is up to this date unfilled.

The present constitution of the board is as follows:

(Vacancy) ..... Term expires February 2, 1883.
G. F. Witter, M. D., Grand Rapids .....Term expires February 2, 1884.
H. P. Strong, M. D., Beloit.....Term expires February 2, 1885.
J. T. Reeve, M. D., Appleton.....Term expires February 2, 1886.
Gen. J. Bintliff, Darlington.....Term expires February 2, 1887.
S. Marks, M. D., Milwaukee.....Term expires February 2, 1888.
K. Hoegh, M. D., La Crosse.....Term expires February 2, 1889.

The following standing committees were appointed at the annual meeting of the Board.

On Finance — Drs. Marks, Witter and Hoegh.
On Legislation — Gen. Bintliff, Drs. Strong and Witter.
On Printing and Stationery — Drs. Reeve, Griffin and Hoegh.
On Visitation and Sanitary Inspection of Public Buildings — Gen. Bintliff, Drs. Marks and Reeve.

During the year there have been in addition to the regular annual and semi-annual meetings of the Board, three

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special meetings, and also some informal meetings of portions of the Board, as occasion required, for conference concerning its work, or for special investigations.

At these meetings the work of the Board has been outlined and certain investigations determined upon, the result of two of which, in addition to the papers which have been approved by you for publication, are presented to you with this report. The investigations referred to are, *first*, "An investigation into the influence of the overflowing of lands for cranberry culture, at, and in the vicinity of Auroraville, upon the health of those living near said lands, undertaken at the request of the Local Board of Health of said village, under circumstances stated in connection with the report"; and, *second*, An examination into the condition of the sewer of the state prison at Waupun, said examination having been requested by his excellency, the Governor, and also by the Board of Health of the cityof Waupun.

REPORTS FBOM LOCAL HEALTH BOARDS.

By the statutes of this state the officers of every town, village or city not otherwise specifically providing for a Board of Health, themselves constitute such Board, and the clerks of such Boards are required to report annually to this Board upon blanks and according to instructions furnished. The following is a copy of the circular of instructions and the blanks for reports sent to these local Boards for the present year:

OFFICE OF STATE BOARD OF HEALTH,
APPLETON, Wis., May 1882.

To the Clerk of the Local Board of Health, or Town, Village or City Clerk:

DEAR SIR:— Enclosed herewith are sent you blank forms for making your Health Report for the year ending May 31, 1882. As heretofore these blanks are sent in duplicate, and after filling them you are requested to return one copy to this office, and place the duplicate on file among your own official records.

It is not necessary to call the attention of clerks who have held office in former years, to the fact that, in the absence of any specific local provisions,

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the regularly elected Town, Village or City Boards are also Boards of of Health, and the clerks thereof *ex-officio* clerks of such local Health Boards, and, as such required to report to this office; but newly elected officers are reminded of this portion of their duties, and all are especially requested to aid to the extent of their abilities in making the reports *as complete and satisfactory a record of the Health conditions of their respective organizations as it is possible to make them*, remembering that this Board has a right to expect from you early and trustworthy information on these matters, and that the subjects themselves are such that, while it is legally your duty to report upon them, you may properly be expected to take such interest in them that your report shall be no merely perfunctory affair, but a substantial contribution to a knowledge of the health of the state. The Board earnestly desires not merely a formal compliance with the law, but intelligent and hearty co-operation from all citizens, and especially from all who are in any way officially related to local Health organizations.*

I take pleasure in acknowledging the fact that increasing interest has been generally manifested by clerks of Local Health Boards in the work of the State Board, the records of which for the last year show reports from about ninety-three per cent. of all the town and other municipal organizations of the state and, while not all of these reports are complete and satisfactory, some indeed being quite otherwise, each year that has passed since the establishment of this Board has witnessed a marked improvement in those respects.

In no single year since this Board was organized, have so many voluntary communications been received giving valuable information concerning the Sanitary conditions of the state, as during the last year. The Board especially invites such voluntary correspondence, in addition to the formal report,

*NOTE. Chapters LVI and LVII, sections 1410 and 1411 of the revised statutes, provide that "town boards, village boards and common councils of every town, village and city shall be boards of health when not otherwise provided in city and village charters, and as such shall exercise all the powers and perform all the duties" prescribed by law to Boards of Health. Under these provisions and without any specific appointment, you as the clerk of your town, village or city, are also the clerk of the Board of Health for such town, village or city, and one of the duties devolving on you in that capacity is to "report at least once a year to the State Board of Health" the transactions of your local Board and "such facts as shall be required, upon blanks and according to instructions furnished," and further "to make special reports whenever you are required to do so." This duty the law demands of you absolutely. Whether the local authorities of your town, village or city have ever assembled and organized as a Board of Health or not, is a question which is not considered in this connection. The law is explicit and requires you in virtue of your office to make the proper returns in any case, and any expenditure for postage, stationery, etc., necessary in connection therewith, is properly chargeable to your official expenses.

Sections 1414, 1415 and 1416 of the revised statutes clothe the Local Health Boards with the most ample powers to do any and every act, which may be necessary for the preservation of the public health. They may make any needful rules and regulations which must be obeyed under heavy penalties; they may enter upon private property and remove or destroy anything there found prejudicial to the health of the community; they may remove any person sick with any contagious or infectious disease, or isolate him in any way or by any means which the circumstances of the case may require; they are, in short, the guardians of public health throughout the state, and have the fullest authority to enforce any measures necessary for the safety of public health in their respective jurisdictions.

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upon any topics of either local or general interest; facts concerning local causes of sickness, and sanitary measures taken by local authority are especially desired. These communications are regarded as being strictly confidential whenever a request to that effect is made.

To the continued prevalence of Small Pox in many parts of the country, your attention has been specially and repeatedly called, during more than a year, and is now again invited. That Wisconsin as a whole has suffered from this disease lightly in comparison with other states, is largely due to the commendable vigilance exercised by our local health authorities, but the malady still exists so extensively in communities with which our citizens are in constant relations, and in countries from which we are almost constantly receiving imigrants, that it is only by continued watchfulness that we can hope to secure continued exemption from its presence. At this time Small Pox exists in at least two places in Wisconsin, into which it was brought direct from foreign countries by imigrants. This board will esteem it as a favor to have, accompanying your formal report, a detailed history of any cases of the disease that may have occurred in your town. The certainty with which the spread of Small Pox may be prevented by isolation, notwithstanding that it ranks among the most contagious of diseases, affords a valuable suggestion as to the facility with which other disorders of the same character may be controlled. Scarlet Fever and Diphtheria, which are in the aggregate vastly more destructive to life than is Small Pox, may be greatly restricted if care be taken to isolate the first cases. It is the hope of securing such results with these and other diseases that stimulates this Board to continued exertion in which it earnestly desires your assistance.

As it is desirable that the Board shall have a complete record of all Physicians in the State, it will be esteemed a favor if you will furnish the names of all who are practicing medicine or surgery in your town at present, together with their P. O. addresses, using the enclosed blank form for the purpose.

You are requested to bear in mind that the labor of compiling, arranging and copying the large number of reports now received is very great, and that it is therefore very much to be desired that *your report* shall be forwarded as promptly as is consistent with correctness; it is for the year ending May 31. It is to be hoped that you have kept such memoranda as will be helpful to you in filling up all blanks, and that you will forward the report early in June.

The sixth report of this Board is still in the printer's hands, but a copy will be forwarded to your address, to be placed on file in your office, as soon after the receipt of your report as possible. As heretofore, it will contain sanitary information and carefully prepared articles on various health matters which will give it permanent interest and value.

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Secretary's Report.

You are again reminded that the board will, on application to the Secretary, be glad to furnish special circulars to any community where Small Pox, Diphtheria or other contagious diseases may prevail, and to co-operate in every practicable way with Local Health Boards for the prevention and control of such diseases.

Respectfully yours,

J. T. REEVE, M. D., Secretary.

By order of the State Board of Health.

ANNUAL REPORT OF THE CLERK OF THE BOARD OF HEALTH FOR THE YEAR ENDING MAY 31, 1882.

To the Secretary of the State Board of Health, Appleton, Wis.:

SIR: The Territory for which this report is made includes the corporate limits of the* —— of ——, in the county of ——, containing about —— acres of land, of which there are now under cultivation about —— acres. The nature of the soil is generally ——. Its population numbers about ——, and is composed chiefly of† ——. Their principal occupation is ——.

I estimate the number of acres of low or wet land from swamps, etc., in above limits to be now about ——. The proportion of this land which is capable of being efficiently drained is ——, and the number of acres of originally wet or low land that have been thoroughly drained during the last year is about ——.

In this locality the drinking water is derived chiefly from ——, and the quality of the water is‡ §——. The wells are of the average depth of —— feet.

The proportion of dwellings having cellars which are wet either habitually or in wet weather is** ——. There has been** —— greater care exercised in the drainage of cellars during the last year than in former years.

The average distance of privies from dwelling houses is —— feet. The average distance of privies from the source of water supply is —— feet; the least distance in any known case is —— feet. There has been** —— greater care exercised in the location and cleansing of privies during the last year than in former years. Earth closets are known to be in use in—— cases.

The diseases which have been most prevalent in this community during the last year have been ——.

Upon the whole the amount of sickness has been ¶ —— than it has averaged for some years past, and the number of deaths has been¶ ——.

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* Insert Township, Village, or City. †Give approximate proportion of nationalities represented. ‡Insert poorly, well, abundantly, &c. §Hard or soft. ¶ Insert greater or less, give proportion if possible. ** Give the facts in the case.

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Secretary's Report.

The whole number of deaths from all causes in this* —— during the past year has been ——.

There have been in this* ——, during the last year, to the best of my knowledge and belief,

—— cases of, and —— deaths from Small Pox, and there are now sick with this disease —— cases.

—— cases of, and —— deaths from Diphtheria, and there are now sick with this disease —— cases.

—— cases of, and —— deaths from Scarlet Fever, and there are now sick with this disease —— cases.

—— cases of, and —— deaths from Typhoid Fever, and there are now sick with this disease —— cases.

—— cases of, and —— deaths from Measles, and there are now sick with this disease —— cases.

—— cases of, and —— deaths from Whooping Cough, and there are now sick with this disease —— cases.

[Please give, on separate sheet, the origin, where known, of any of these diseases; and the history of any special epidemics with the means which have been adopted to prevent their spread, with results; also a detailed history of any cases where it is believed that sickness of any kind has been caused by contamination of the water supply.]

The diseases prevailing at the date of this report, other than those enumerated are ——.

This Board of Health has appointed Doctor ——, as its health physician. His P. O. address is ——. He is paid a salary of $—— per year.

During the past year this Board has held —— regular or special meetings, and its most important acts have been ——.

My post-office address is ——.

Dated, ——. Signature, —— ——.

Clerk of the Board of Health for the* —— of ——, State of Wisconsin.

The number of reports received in reply to the above has been very nearly the same as those received for the year 1881, but I am glad to report a continuous improvement both in the fullness of the reports received, and in the promptness with which they have generally been made, though there are still many who do not appreciate how helpful greater fullness and greater promptness would be to us, or how much more valuable *our* reports might be made by their intelligent co-operation.

No very large increase in the number of these reports is to be looked for in the future, by far the greater part of all

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the towns in the state being at present in communication with this office. Until human nature reaches absolute perfection, there will always be a certain proportion of men holding important offices who will endeavor to evade the performance of any duty which may involve a little extra trouble. One of this class for two successive years caused the blanks sent to him from this office to be returned, with the usual official stamp of the postal service, implying that the individual addressed was not to be found. Quiet inquiry from our correspondents in his vicinity proved that there was no mistake, (as occasionally unavoidably occurs,) in securing the proper name and address, and the blanks were placed in a plain envelope, accompanied by a very plainly worded letter addressed to the individual in question; it is only necessary to add that within a short time after this missive was despatched a very full report was received. Another kindly offered to give the required information for the sum of twenty-five dollars, and became very indignant when the fact was pointed out to him that the law expressly made the furnishing thereof one of the duties pertaining to his office. Such cases as these are the very rare exceptions however at this time, the vast majority of all town clerks and other local officers recognizing the importance of the Board's work, and giving all the aid thereto that lies in their power; this gratifying fact is shown by the increasing number of voluntary communications which have accompanied the formal reports required of them, from many of which extracts have been made which form an interesting addition to the extracts from special correspondence submitted herewith, and also by the frequency with which the advice of the Board is sought on some question of local sanitation.

The whole number of reports received for the year ending May 31, 1882, was 896, the following counties having made complete returns, to wit:

Ashland, Bayfield, Burnett, Calumet, Crawford, Door,

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Douglas, Green Lake, Jefferson, Kenosha, Langlade, Marathon, Marinette, Milwaukee, Monroe, Oconto, Ozaukee, Pepin, Pierce, Polk, Price, Racine, Richland, Rock, St. Croix, Taylor, Walworth, Washington and Waupaca, twenty-nine in all, while nine others, viz., Buffalo, Dunn, Iowa, LaFayette, Lincoln, Manitowoc, Marquette, Vernon and Waushara, lack each only a single town to render their returns complete also.

In accordance with our custom hitherto, we give a list of all towns from which reports have been received for the year, and also a list of towns which are delinquent.

LIST OF TOWNS, CITIES AND VILLAGES FROM WHICH REPORTS HAVE BEEN RECEIVED FOR THE YEAR ENDING MAY 31, 1882.

Adams County—Big Flats, Dell Prairie, Easton, Leola, Lincoln, Monroe, New Chester, New Haven, Preston, Quincy, Richfield, Rome, Springville, Strong's Prairie.

Ashland County—Ashland, Butternut, Jacobs.

Barron County—Cedar Lake, Clinton, Dallas, Maple Grove, Prairie Farm, Shetek, Stanfold, Stanley, Sumner, Turtle Lake, Vance Creek.

Bayfield County—Bayfield.

Brown County—Allouez, Ashwaubenon, Bellevue, Depere (town), Eaton, Glenmore, Green Bay (town), Holland, Howard, Humboldt, Lawrence, New Denmark, Pittsfield, Preble, Rockland, Scott, Suamico, West Depere.

Buffalo County—Alma (town), Alma (village), Belvidere, Buffalo (town), Buffalo (city), Canton, Cross, Dover, Fountain City, Gilmanton, Glencoe, Lincoln, Maxville, Milton, Mondovi, Montana, Naples, Nelson, Waumandee.

Burnett County—Bashaw, Grantsburg, Marshland, Trade Lake, Wood Lake.

Calumet County—Brillion, Brothertown, Charlestown, Chilton (town), Chilton (city), Harrison, New Holstein, Rantoul, Stockbridge, Woodville.

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Chippewa County—Anson, Auburn, Bloomer, Eagle Point, Edson, Flambeau, La Fayette, Sigel, Wheaton.

Clark County—Beaver, Colby, Eaton, Fremont, Grant, Hewitt, Hixon, Levis, Loyal, Lynn, Mayville (including village of Dorchester), Mentor, Neillsville, Pine Valley, Sherman, Thorp, Unity, Warner, Washburn, Weston, Withee, York.

Columbia County—Arlington, Caledonia, Columbus (town), Columbus (city), Courtland, Dekorra, Fort Winnebago, Leeds, Lewiston, Lodi, Lowville, Marcellon, Otsego, Pacific, Portage City, Scott, Springvale, West Point, Wyocena.

Crawford County—Bridgeport, Clayton, Eastman, Freeman, Haney, Marietta, Prairie du Chien, Scott, Seneca, Utica, Wauzeka.

Dane County—Albion, Berry, Black Earth, Blooming Grove, Bristol, Christiana, Cottage Grove, Cross Plains, Dane, Deerfield, Dunkirk, Dunn, Fitchburg, Madison (town), Madison (city), Mazomanie, Montrose, Oregon, Perry, Primrose, Pleasant Springs, Roxbury, Rutland, Springdale, Springfield, Stoughton, Sun Prairie (town), Sun Prairie (village), Vermont, Verona, Vienna, Westport, Windsor.

Dodge County—Ashippun, Beaver Dam (town), Beaver Dam (city), Burnett, Calamus, Chester, Clyman, Elba, Emmett, Fox Lake, Hubbard, Hustisford, Juneau, Lebanon, Le Roy, Lomira, Lowell, Oak Grove, Portland, Randolph, Rubicon, Shields, Theresa, Waupun (city), Westford.

Door County—Bailey's Harbor, Brussells, Clay Banks, Egg Harbor, Forestville, Gardner, Gibraltar, Jacksonport, Liberty Grove, Nasewaupee, Sevastopol, Sturgeon Bay (town), Sturgeon Bay (village), Union, Washington.

Douglas County—Superior.

Dunn County—Colfax, Dunn, Eau Galle, Elk Mound, Hay River, Lucas, New Haven, Otter Creek, Peru, Red Cedar, Rock Creek, Sand Creek, Sheridan, Sherman, Spring Brook, Stanton, Tainter, Tiffany, Weston.

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Eau Claire County—Augusta, Brunswick, Drammen, Fairchild, Lincoln, Ludington, Otter Creek, Pleasant Valley, Seymour, Union, Washington.

Fond du Lac County—Alto, Ashford, Byron, Calumet, Eden, El Dorado, Empire, Fond du Lac (town), Fond du Lac (city), Forest, Friendship, Metomen (including village of Brandon), Osceola, Ripon (town), Ripon (city), Rosendale, Springvale, Taycheedah, Waupun (town).

Grant County—Beetown, Bloomington (town), Bloomington (village), Boscobel, Cassville, Castle Rock, Clifton, Ellenboro, Fennimore, Glen Haven, Harrison, Hickory Grove, Jamestown, Liberty, Lima, Little Grant, Marion, Millville, Mt. Ida, Paris, Patch Grove, Smelzer, Waterloo, Wingville, Wyalusing.

Green County—Adams, Albany, Cadiz, Clarno, Decatur (including village of Brodhead), Jefferson, Jordan, Monroe (including village of Monroe), Mount Pleasant, New Glarus, Spring Grove, Sylvester, Washington, York.

Green Lake County—Berlin (town), Berlin (city), Brooklyn, Green Lake, Kingston, Mackford, Manchester, Marquette, Princeton, St Marie, Seneca.

Iowa County—Clyde, Dodgeville, Eden, Highland, Linden, Mifflin, Mineral Point (town), Mineral Point (city), Moscow, Pulaski, Ridgeway, Waldwick, Wyoming.

Jackson County.—Albion (including Black River Falls), Franklin, Garfield, Hixton, Manchester, Melrose, Merrillan, Millston, Northfield, Springfield, Sullivan.

Jefferson County—Aztalan, Cold Spring, Concord, Farmington, Hebron, Ixonia, Jefferson, Koshkonong, Lake Mills, Milford, Oakland, Palmyra (town), Palmyra (village), Sullivan, Sumner, Waterloo (town), Waterloo (village), Watertown (town), Watertown (city).

Juneau County—Armenia, Clearfield, Fountain, Germantown, Kildare, Kingston, Lemonweir, Lindina, Lisbon, Lyn-

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don, Marion, Necedah, New Lisbon, Orange, Seven Mile Creek, Summit, Wonewoc.

Kenosha County — Brighton, Bristol, Kenosha, Paris, Pleasant Prairie, Randall, Salem, Somers, Wheatland.

Kewaunee County — Ahnapee, Franklin, Kewaunee (town), Lincoln, Montpelier, Pierce, West Kewaunee.

La Crosse County — Bangor, Barre, Burns, Farmington, Greenfield, Hamilton, Holland, Shelby, Washington.

La Fayette County — Argyle, Belmont, Benton, Blanchard, Elk Grove, Fayette, Gratiot, Kendall, Monticello, New Diggings, Seymour, Shullsburg, Wayne, White Oak Springs, Willow Springs, Wiota.

Langlade County — Antigo, Carpenter, Gagen, Norwood, Polar, Rolling.

Lincoln County — Ackley, Corning, Pine Plains, Rock Falls, Scott.

Manitowoc County — Cato, Centreville, Cooperstown, Eaton, Franklin, Gibson, Kossuth, Liberty, Manitowoc (town), Manitowoc Rapids, Maple Grove, Meeme, Mishicott, Newton, Rockland, Schleswig, Two Creeks, Two Rivers (town), Two Rivers (city).

Marathon County — Bergen, Berlin, Brighton, Day, Easton, Hamburg, Holton, Hull, Knowlton, Maine, Marathon, Mosinee, Rib Falls, Rietbrock, Spencer, Stettin, Texas, Wausau (town), Wausau (city), Wein, Weston.

Marinette County — Marinette, Peshtigo.

Marquette County — Buffalo, Crystal Lake, Douglas, Harris, Mecan, Montello, Moundville, Neshkoro, Newton, Oxford, Packwaukee, Shields, Westfield.

Milwaukee County — Franklin, Granville, Greenfield, Lake, Milwaukee (town), Milwaukee (city), Oak Creek, Wauwatosa.

Monroe County — Adrian, Angelo, Byron, Clifton, Glendale, Greenfield, Jefferson, La Fayette, La Grange, Leon, Lincoln, Little Falls, New Lyme, Oakdale, Portland,

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Ridgeville, Sheldon, Sparta, Tomah, Wellington, Wells, Wilton.

Oconto County—Gillet, Howe, Little River, Little Suamico, Maple Valley, Oconto (town), Oconto (city), Pensaukee, Stiles.

Outagamie County—Appleton, Black Creek, Bovina, Buchanan, Centre, Cicero, Dale, Deer Creek, Ellington, Grand Chute, Greenville, Hortonia, Liberty, Maine, Maple Creek, Osborne, Seymour (town), Seymour (city).

Ozaukee County—Belgium, Cedarburg, Fredonia, Grafton, Mequon, Port Washington (town), Port Washington (city), Saukville.

Pepin County—Albany, Durand, Frankfort, Lima, Pepin, Stockholm, Waterville, Waubeck.

Pierce County—Clifton, Diamond Bluff, Ellsworth, El Paso, Gilman, Hartland, Isabelle, Maiden Rock, Martell, Oak Grove, Prescott, River Falls, Rock Elm, Salem, Spring Lake, Trenton, Trimbelle, Union.

Polk County—Alden, Apple River, Balsam Lake, Black Brook, Clam Falls, Clear Lake, Clayton, Eureka, Farmington, Georgetown, Laketown, Lincoln, Lorraine, Luck, Milltown, Osceola, St. Croix Falls, Sterling, West Sweden.

Portage County—Alban, Amherst, Belmont, Carson, Eau Pleine, Grant, Hull, Linwood, New Hope, Pine Grove, Plover, Sharon, Stevens' Point (town), Stevens' Point (city), Stockton.

Price County.—Brannan, Fifield, Worcester.

Racine County—Burlington, Caledonia, Dover, Mt. Pleasant, Norway, Racine, Raymond, Rochester, Waterford, Yorkville.

Richland County—Akan, Bloom, Buena Vista, Dayton, Eagle, Forest, Henrietta, Ithaca, Marshall, Orion, Richland, Richwood, Rockbridge, Sylvan, Westford, Willow.

Rock County—Avon, Beloit (town), Beloit (city), Bradford, Centre, Clinton, Evansville, Fulton, Harmony, Janesville

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(town), Janesville (city), Johnston, La Prairie, Lima, Magnolia, Milton, Newark, Plymouth, Porter, Rock, Spring Valley, Turtle, Union.

St. Croix County—Baldwin, Cady, Cylon, Eau Galle, Emerald, Erin Prairie, Forest, Hammond (town), Hammond (village), Hudson (town), Hudson (city), Kinnikinnick, New Richmond (town), New Richmond (village), Pleasant Valley, Rush River, Star Prairie, Somerset, Springfield, St. Joseph, Stanton, Troy, Warren.

Sauk County—Baraboo, Bear Creek, Dellona, Delton, Excelsior, Fairfield, Franklin, Freedom, Greenfield, Honey Creek, Ironton, La Valle, Merrimack, Prairie du Sac (including Sauk City), Reedsburg, Spring Green (town), Spring Green (village), Sumpter, Troy, Washington, Westfield, Woodland.

Shawano County—Almon, Angelica, Fairbanks, Green Valley, Grant, Hartland, Herman, Lessor, Maple Grove, Morris, Navarino, Pella, Richmond, Seneca, Washington, Waukeechon, Wittenberg.

Sheboygan County—Greenbush, Herman, Holland, Lima, Mitchell, Mosel, Rhine, Sheboygan (town), Sheboygan (city), Sheboygan Falls (town), Sheboygan Falls (village), Sherman, Wilson.

Taylor County—Chelsea, Deer Creek, Little Black, Medford, Westboro.

Trempealeau County—Albion, Arcadia (town), Arcadia (village), Caledonia, Chimney Rock, Dodge, Ettrick, Gale, Hale, Lincoln, Pigeon, Preston, Trempealeau, Unity.

Vernon County—Bergen, Christiana, Coon, Forest, Franklin, Geneva, Greenwood, Hamburg, Harmony, Hillsboro, Jefferson, Kickapoo, Liberty, Stark, Sterling, Union, Viroqua, Webster, Wheatland, Whitestown.

Walworth County—Bloomfield, Darien, Delavan, East Troy, Elkhorn, Geneva, La Fayette, La Grange, Linn, Lyons,

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Richmond, Sharon, Spring Prairie, Sugar Creek, Troy, Walworth, Whitewater.

Washington County — Addison, Barton, Erin, Farmington, Germantown, Hartford, Jackson, Kewaskum, Polk, Richfield, Schleisingerville, Trenton, Wayne, West Bend (town), West Bend (village).

Waukesha County — Brookfield, Eagle, Lisbon, Menomonee, Merton, Muskwanago, New Berlin, Ottawa, Oconomowoc (town), Oconomowoc (city), Pewaukee, Summit, Vernon, Waukesha (town).

Waupaca County — Bear Creek, Caledonia, Dayton, Dupont, Farmington, Fremont (town), Fremont (village), Helvetia, Iola, Larrabee, Lebanon, Lind, Little Wolf, Matteson, Mukwa, New London, Royalton, St. Lawrence, Scandinavia, Union, Waupaca (town), Waupaca (city), Weyauwega.

Waushara Connty — Aurora, Coloma, Dakota, Deerfield, Hancock, Leon, Marion, Mt. Morris, Oasis, Plainfield, Poysippi, Richford, Rose, Saxville, Springwater, Warren, Wautoma.

Winnebago County — Algoma, Black Wolf, Clayton, Menasha (town), Menasha (city), Neenah (town), Nekimi, Nepewskun, Oshkosh (town), Oshkosh (city), Poygan, Rushford, Utica, Vinland, Winchester, Winneconne, Wolf River.

Wood County — Auburndale, Grand Rapids (town), Lincoln, Marshfield, Port Edwards, Rock, Saratoga, Seneca, Sigel, Wood.

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LIST OF TOWNS, CITIES AND VILLAGES FROM WHICH NO REPORTS HAVE BEEN RECEIVED.

Adams County — Adams, Jackson.

Barron County — Barron, Cumberland (village).

Brown County — Depere (village), Fort Howard * (city), Green Bay (city),† Morrison, Wrightstown.

† Reports were received from Fort Howard, Green Bay, Depere and some other places on this list concerning *Small Pox* and its course, but such reports, made by resident physicians, must not be confounded with the formal reports which should be made by the Local Health Boards, which last are the only ones here considered.

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Buffalo County — Modena.

Chippewa County — Big Bend, Chippewa Falls, Wheaton.

Clark County — Sherwood, Forest, Warner.

Columbia County — Fountain Prairie,* Hampden,* Kilbourne City, Newport, Randolph.

Dane County — Blue Mounds, Burke,* Medina, Middleton,* York.

Dodge County — Herman, Trenton, Williamstown.

Dunn County — Menomonee.

Eau Claire County — Eau Claire, Union.

Fond du Lac County — Auburn, Lamartine,* Marshfield,* Oakfield.*

Grant County — Hazel Green, Lancaster,* Mt. Hope, Muscoda, Platteville, Potosi, Watterstown,* Woodman.

Green County — Brooklyn, Exeter.

Iowa County — Arena.

Jackson County — Alma, Garden Valley, Irving.

Juneau County — Mauston, Plymouth.

Kewaunee County — Carlton, Casco, Kewaunee (village), Red River.

La Crosse County — Campbell, La Crosse, Onalaska.

La Fayette County — Darlington.

Lincoln County — Merrill.

Manitowoc County — Manitowoc (city).

Marquette County — Springfield.*

Outagamie County — Freedom, Kaukauna.*

Portage County — Almond, Buena Vista,* Lanark.*

Sauk County — Baraboo (village), Winfield.

Shawano County — Belle Plaine, Hutchinson, Shawano (city).

Sheboygan County — Lyndon, Plymouth (town), Plymouth (city), Russel.*

Trempealeau County — Burnside, Sumner.

Vernon County — Clinton.

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Waukesha County—Delafield, Genesee,* Muskego, Waukesha (village).

Waushara County—Bloomfield.

Winnebago County—Neenah (city), Omro.

Wood County—Centralia, Dexter, Grand Rapids (city) Remington, Rudolph.

The towns of which the names are marked by an asterisk have never thus far made any report to this office. The number of these is now very small and is decreasing every year; they are for the most part places of no very great importance, only five of the whole number having populations exceeding fifteen hundred, according to the census of 1880, and at least half of the remainder fall below one thousand; still in the aggregate these places represent about twenty-two thousand of our citizens, a number quite sufficient to render knowledge of their sanitary conditions and surroundings desirable, and to justify special and continued effort to obtain such knowledge.

SICKNESS AND ITS DISTRIBUTION.

Of the six diseases that have thus far formed the subjects of regular annual inquiry, the history of one, the most generally dreaded of all, though far from being the most fatal, as it occurred during the year in Wisconsin, will be presented to you at length elsewhere. For the purpose of comparison, however, the returns of all the six as made in the reports from the clerks of local boards are given in the customary tabular form.

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Secretary's Report.

TABLE I.

Showing Cases of Disease as Actually Reported, Outside of Milwaukee.

	Small Pox.	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Measles.	Whooping Cough.
No. of towns reporting.....	82	491	278	350	501	275
No. of cases reported.....	645	6,337	2,962	2,013	15,322	5,219
No. of deaths reported.....	109	1,496	413	401	258	88

The above table is constructed upon the returns of cases and deaths as actually reported from all parts of the state, excluding the city of Milwaukee, because the monthly reports received from thence give deaths only, presumably with almost or quite perfect accuracy. Hence it is necessary to estimate the cases of sickness occurring in that city, taking as a basis the number of its residents, the number of deaths from each disease and such other data as are accessable.

There are also reports, the authors of which have apparently been at very small pains to ascertain the facts upon which information is particularly desirable, but have contented themselves with intimating that one or another disease has appeared in their respective townships, by simply writing "few, many, several, some," and similar indefinite expressions in the space designed for numbers. It is obvious that no information can be gathered from such reports beyond the mere fact that the diseases thus specified have prevailed to a greater or less extent in certain places. Reports of this kind have therefore been disregarded as being too indefinite to base any statistics upon, but inasmuch as we have accurate reports of the number of *deaths* from these diseases in Milwaukee during the year we may, without going far

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astray, estimate that the ratio of mortality from them has been the same in that city as in other parts of the state. Upon this estimate the following table is constructed, in which the statistics of the city of Milwaukee are added to those already given from the remainder of the state.

TABLE II.

Showing Whole Number of Cases of Disease as Actually Reported for the Year, Including the City of Milwaukee:

	Small Pox.	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Measles.	Whooping Cough.
No. of towns reporting....	83	492	279	351	502	276
No. of cases reported.....	707	6,757	3,492	2,249	16,682	5,572
No. of deaths reported....	121	1,593	487	447	280	94

It would probably be both safe and proper to add about eighteen per cent. to each of the above numbers, excepting only those relating to Small Pox, to cover the cases and deaths which have either not been reported at all or have been reported so indefinitely as to render their rejection necessary, but it has been the purpose in this report to give only actual returns.

These tables show a large increase in the number of cases of Small Pox as compared with previous years, an increase which was anticipated, and as far as possible guarded against by this Board by the repeated distribution of circulars of warning, the first of which was issued several months before the disease had appeared in this state, and in view of its prevalence in other sections of the country with which our citizen were in constant communications. As it gradually but repeatedly invaded this state the correspondence of this office was greatly increased, the de-

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mands for advice both from officials and citizens being both numerous and urgent. These demands were cheerfully complied with and advice and counsel were freely given in all cases, and circulars giving directions for the restriction and management of the disease were distributed in very large numbers.

The need of such advice and of sound, but simple and practical instruction concerning the nature of this disease and the means by which it may be prevented, is well illustrated, not alone by the eager desire of the people for such information, but also by the character of the literature on this subject, which in its absence is supplied even by Local Health Boards, and those who should be leaders and instructors of the people. One of these Boards, for example, being in fear that Small Pox, which was prevalent in a severe form in a town immediately adjoining it, would also reach the territory under its supervision, published and distributed largely as a circular, some so-called "Common Sense Hints," which it had copied from a daily paper printed in another state, which,while commending vaccination in a very weak and feeble way as "an invention to meet the disease generally" and temporarily declares that this "invention" while it has diminished the virulence of Small Pox "has also perpetuated it." The circular characterizes Small Pox as "a created disease," "created by neglect of the laws of nature," says that it may be caused by eating improper food, by uncleanliness of person, or by unsanitary surroundings, and stating its desire to be to drive away the fear of Small Pox, declares it to be "a disease of neglect," commends as neutralizing agents, cleanliness, fresh air, healthy food and exercise, and declares that the fumes of pure alcohol, and washings with alcohol and with amonia, are preventives, and that the fumes of vinegar is "a sure pretive of contagion."

The whole tendency of such a circular is to confuse and

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to darken that which should be clear and plain, and the little that is good in it, is lost sight of in the much that is misleading—one can hardly read such a paper without feeling how large the field is which state medicine is called upon to occupy, or how urgent its demands. As this disease has attracted to an unusual degree both public and professional attention during the year, we give here in connected form as complete an account of its course, progress and extent in Wisconsin, as it has been possible to obtain from the very full correspondence had with those who had the best possible opportunity for knowing the facts, to wit—the physicians who had the care of the patients. It should be borne in mind that this history (being obtained from a different source, and also covering a somewhat different period), will not be found in its statistical part to agree wholly with the reports given by clerks of Local Boards of Health and embodied in preceding tables; but considering the excitement caused by the outbreak of Small Pox wherever it appeared, it is somewhat remarkable that the two sets of statements should agree so closely as they do.

As showing in what localities the disease has been most prevalent we may state that Brown and Manitowoc counties seem to have suffered most severely; seventy-seven cases are reported from each of these counties, with fifteen deaths in Brown, and twelve in Manitowoc. In both these counties concealment of the disease was practiced, and many were exposed by this criminal procedure who were wholly unconscious of the danger. Milwaukee, as might be expected, reports quite a large number of cases, fifty-six in all with thirteen deaths. Calumet county comes next with fifty-two cases, and nine deaths, and Dodge county follows with forty-six cases, though only two of this number are reported as proving fatal. * Waupaca county comes next, twenty-seven

*(Note.) So small a mortality as that reported from Dodge county gives rise to the suspicion that some cases were mistaken for Small Pox which were not really so.

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cases being reported from thence with five deaths; here a mistaken diagnosis of Measles followed by a party at the house, gives sufficient explanation of the spread of the disease; in Dunn county, twenty-six cases are reported with eleven deaths; St. Croix county makes return of twenty-one cases, five ending fatally; Richland county with eighteen cases and five deaths; Green Lake and Rock, with seventeen cases each; Fond du Lac, Sauk and Winnebago, with fifteen cases each; Jefferson with fourteen cases; Columbus and Portage with thirteen cases each; Monroe, Racine and Walworth each with twelve cases; Oconto with eleven, and Dane with ten cases, follow next in order; Clark, Crawford, Grant, Green, Juneau, Kenosha, Kewaunee, La Crosse, Marathon, Outagamie, Ozaukee, Sheboygan, Vernon, Washington and Waukesha counties, all have small numbers with a low rate of mortality.

The whole history of Small Pox during the year goes to enforce once more the lesson that it is the same contagious, fatal disease that it has been in all past time, and that they are wholly in the wrong who claim that it has lost any of its deadly might, either through any process of wearing out or through any accession to human powers of resistance. In general we may say, however, of the progress of this disease in Wisconsin, that as a result of the very laudable efforts made by local boards of health, and by private citizens, it was speedily checked and controlled in nearly all places where it appeared. The only exceptions were those of localities where it had obtained a special foothold through mistaken diagnosis, or where, as happened in several instances, patients suffering from it were concealed, their relatives and attendants meanwhile mingling freely with neighbors and fellow-citizens, thus becoming centres of infection from which Small Pox was propagated without suspicion being excited, until the mischievous work was done. In spite of such cases, however, we have to congratulate the

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people of Wisconsin upon the fact that the disease was confined to comparatively narrow limits and that our state has suffered lightly as compared with other communities.

Following is the historical account referred to:

SMALL POX IN WISCONSIN.

During the latter half of the year 1880 the attention of this and other State Boards of Health was drawn to the fact of the great prevalence of Small Pox in various parts of the world, but more particularly to its existence in those portions of Europe from which we receive large numbers of immigrants, and upon our own Atlantic seaboard. Early in 1881, the disease having extended to states immediately bordering on Wisconsin, and being prevalent along the main lines of travel from the coast to the western and northwestern states, and thus being liable to appear in our own territory at almost any time, this Board felt that it was called upon to issue a circular* calling attention to the danger, and the means whereby it might be avoided. This circular was speedily followed by another,† giving the advise most approved by high sanitary authority for the restriction of the disease should it unfortunately make its appearance in any community, and the best means for keeping it out altogether.

The circulars were distributed as widely as possible (the press of the state doing valuable service in calling public attention to them, in many instances reprinting them either wholly or in substance), and were the means of making known to our citizens generally the fact of impending danger. Many were wise in time and adopted the only means known by which the attacks of Small Pox may be prevented, but in this, as in every other community, there was a certain proportion of its members who, either through habits of procrastination, or carelessness, or disbelief in the

† Printed on p. lx of the 6th Rept.

* Issued Feb. 1881, and printed on p. lviii of the 6th Rept.

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efficacy of the preventive, or some other similar reason, neglected to avail themselves of the protection which vaccination offers, and thus formed a mass of material upon which the disorder could readily seize.

This proportion amounted probably to from twenty-five to thirty per cent. of the whole population; with this number of unprotected individuals scattered all over it, Wisconsin could not hope to escape a visitation of Small Pox more or less severe, and accordingly, toward the end of 1881, it came. From various authentic sources we have the history, more or less complete of about four hundred and fifty cases, with a mortality of about fifteen per cent. In addition to these known and recorded cases there were others to the number in all of perhaps one hundred and fifty or even more of which we have no history, and among a certain portion of these the mortality was probably greater than that above stated. The localities in which most of these cases of the disease occurred are known, and in some instances the names of the physicians who had charge of the patients have been furnished, but we have been unable to obtain any facts in relation to them; in other places only the occurrence of the disease was reported together with such circumstances as were generally known to residents of the vicinity, usually sufficient to place the fact of the existence of the disease beyond question, but it was found impracticable to ascertain the name and address of the medical attendant.

In order to obtain the fullest and most trustworthy information copies of the following circular were sent in the first instance to all the regular correspondents of the Board and to all Health Officers whose names and addresses were in its possession, and, as fast as answers were received, copies were sent to all physicians reported as having had charge of Small Pox patients within the period named in the circular.

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Secretary's Report.

WISCONSIN STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
APPLETON, August, 1882.

DR. —— ——:

DEAR DOCTOR: This Board again returns thanks to its special correspondents, to Health Officers and to other physicians for courteous and valued answers to circulars heretofore issued, and will be placed under renewed obligations if, in reply to this, you will kindly favor it with such information as you may be able to give relative to the prevalent diseases, the causes thereof, and the general health conditions of the locality in which you reside.

Suggestions concerning the sanitary needs of any part of the state, and facts concerning any local or general unsanitary conditions are especially desired, and, while it is the wish of the Board to have liberty to publish your reply, upon any expression of preference on your part that the whole or any part of your letter be considered as confidential, it will be so regarded.

That there may be obtained at this time as complete a history of the recent epidemic of Small Pox as it is possible to obtain, will you kindly and fully reply to the following questions, writing your answers in the blank spaces following, if there be room. If there is not room fully to give your answer, please continue the same on a separate sheet, upon which it will be sufficient to refer to the questions by their numbers only.

A stamped envelope is enclosed for reply. Please use it, leaving any excess of postage to be paid at this office. It is requested that you will send your reply as early in the month of September as possible.

By order of the Board. Very respectfully,

J. T. REEVE, M. D., *Secretary.*

1. Are there now *i. e.* at the date of your answer, any cases of Small Pox under your care?

2. How many cases of Small Pox have occurred in your practice, within the state during the prevalence of the recent epidemic at any time during the year 1881, and up to August 31, 1882. *Please give date of the first case.* How many of these cases resulted fatally?

3. Please give the ages of the patients, stating which were the cases which resulted fatally.

4. Of the cases occurring in your practice during the time named how many had been previously "successfully" vaccinated *more than once*, as shown by typical cicatrices? (Please give the dates of the vaccinations if practicable.) How many such cases ended fatally?

5. How many cases had been previously *once* successfully vaccinnated, as above described? (Give date of the operation.) How many such cases proved fatal?

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6. How many cases had been vaccinated once or more times, *without success, i. e.* without the production of a typical cicatrix? How many such cases proved fatal?

7. How many had never been vaccinated at all? How many of this class of cases proved fatal?

8. At this present time and after the unusual number of vaccinations performed during the past year, what proportion of the people of Wisconsin within your knowledge are now protected against Small Pox, *i. e.*, bear cicatrices that may properly be called typical?

9. Do you believe that a single successful vaccination *i. e.*, one giving typical results, is a perfect protection against Small Pox for life or for any definite period? How often do you advise re-vaccination?

10. In your own practice have you exclusively or habitually confined yourself to the use of one form of virus (either Bovine or Humanized)? If so, please state which and give the reasons for your preference.

11. Have you ever had *personal knowledge* of the communication of any disease, other than the vaccine by the medium of vaccination? If so, please give as full particulars as practicable.

12. How did Small Pox as it occurred in your practice, or in your neighborhood originate? Please answer as fully as possible, giving history of first case.

13. At the first appearance of the disease, was your Local Health Board so organized that it was at once able to act efficiently in such an emergency as the outbreak of a dangerous contagious disorder?

14. What measures were taken by the Local Board to prevent the spread of Small Pox, and how soon after the presence of the disease was known were such measures inaugurated?

15. With what success were preventive or restrictive measures carried out?

16. Had there been a better or earlier organization of the Local Health Board, is it your opinion that better results would have been attained?

17. Please give any peculiar or specially noteworthy facts or circumstances connected with the occurrence of the disease in your vicinity.

18. Do you know of any cases of Small Pox now existing at any point in this State? If so can you give the name and address of the physician attending?

19. Please furnish us with the names and address of any physician in Wisconsin whom you know to have had charge of any case of Small Pox at any time during the years 1881 and 1882.

20. To what extent has Diphtheria prevailed in your locality during the past year, and what has been its type as compared with the type of preceding years?

21. Has there been in the best of your judgment, either in the homes

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where Diphtheria has prevailed or in their immediate surroundings any one constant unsanitary condition, or any such condition usually present which might either cause or modify the disease; especially do you believe that wet cellars or excessive soil saturation from marshy lands, etc., has any special influence upon the prevalence or malignancy of Diphtheria?

22. If Diphtheria has either notably increased or diminished in your neighborhood during the past year, to what cause do you attribute such change?

23. Additional information relative to the above or to other prevalent diseases—to local unsanitary conditions—to matters of general or personal Hygiene—suggestions, etc., etc.

Name of correspondent answering as above, ——— ———.

Post Office address, ——— ———.

Date, ——— ———.

To this circular answers were received from the following gentlemen, and from their communications is drawn the information given in the following pages. For convenience of reference the names are arranged in alphabetical order without regard to the date at which the reply came to hand: J. M. Adams, Lomira; W. R. Allison, Independence; L. G. Armstrong, Boscobel; C. B. Bannister, Eagle; J. R. Barnett, Neenah; J. K. Bartlett, Milwaukee; W. H. Bartran, Ft. Howard; J. J. Bennett, Jefferson; A. W. Bickford, Richland Centre; G. A. Bodenstab, Fountain City; C. E. Booth, Elroy; H. L. Barnes, Ripon; B. C. Brett, Green Bay; R. Broughton, Brodhead; S. C. Buchan, Union Grove; W. D. Bulkley, Lyndon; F. W. Byers, Monroe; J. W. Cairncross, Mukwanago; F. A. Canfield, Necedah; G. E. Catlin, Geneva; L. W. Clarke, Cambridge; J. N. Clemmer, Juda; C. B. Cody, Sheboygan Falls; H. B. Cole, Black River Falls; C. T. Corey, Patch Grove; R. Cottington, Bloomer; G. Covert, Clinton; J. R. Currens, Two Rivers; J. S. Daniells, Omro; M. T. Darling, Burlington; D. C. Davies, Columbus; M. M. Davis, Baraboo; J. B. Devlin, Calumet Harbor; J. W. De Voe, Wausau; J. Dinsdale, Soldiers' Grove; F. H. Dodge, Lake Mills; G. W. Dodge, Menasha; N. M. Dodson, Berlin; W.

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H. Earles, Wrightstown; C. D. Eddy, Fremont; L. Eidemiller, New Cassel; E. Ellis, Ashland; O. Ewers, De Soto; J. Finney, Clintonville; M. H. Fisk, Depere; L. Formes, Kellnersville; E. T. Ganneau, Superior; B. M. Gill, Linden; T. Gillespie, Kenosha; H. Gilluly, Union Centre; C. Girard, Spaulding, Michigan; M. P. Goodwin, Clear Lake; W. A. Gott, Viroqua; L. Grasmuck, Menasha; H. Grivelly, Colby; J. C. Hall, Monroe; S. Hall, Rosendale; W. E. Hallock, Juneau; J. M. Harrison, Friendship; J. D. W. Heath, Shawano; C. Hebard, Mondovi; J. J. Herrick, Mauston; H. M. Hittner, Mishicott; K. Hoegh, La Crosse; S. B. Hubbell, Medford; A. T. Hunter, Stockbridge; G. W. Jenkins, Kilbourn City; H. L. Jenckes, Glen Haven; B. D. Jewell, Pine River; J. S. Johnson, Oxfordville; A. Jones, Delton; A. F. Jones, Sauk City; E. S. Kellogg, Wrightstown; E. Le Sage, Sheboygan; E. J. Lewis, Ironton; E. E. Loomis, Janesville; G. T. Loomis, Cascade; T. E. Loop, Eureka; O. G. Lord, Kaukanna; D. W. Lynch, West Bend; C. Mahneke, Hilbert; T. C. Malone, St. Martin's; D. L. Manchester, Waupaca; I. Manley, Markesan; L. O. E. Manning, Big Flats; C. A. Marquardt, La Crosse; R. Martin, Milwaukee; J. Massmann, Mayville; N. Mattson, St. Croix Falls; I. N. McComb, Brillion; N. McVey, Alma; J. G. Meachem, Racine; S. A. Meller, Retreat; B. J. Merrill, Stillwater, Minn.; N. T. Millard, Princeton; C. I. Miller, Whitewater; E. Monteith, Colfax; D. W. Moore, Waupun; J. R. Moore, New London; J. J. Morgan, Arkansaw; D. P. Moriarity, Oconto; D. G. Morris, Sharon; H. Morrow, Gillingham; O. N. Murdock, New Richmond; L. H. Nichol, Shetek; W. F. Nichols, Menomonee; J. C. Noyes, Oshkosh; R. S. O'Conneil, Cato; J. Oettiker, Georgetown; H. M. Parrott, Douglas Centre; J. Phillips, Stevens Point; W. J. Pierce, Cobb; F. Pinch, Hillsborough; J. F. Pritchard, Manitowoc; F. S. Raynolds, Neosho; W. W. Reed, Jefferson; J. W. Regan, Oconomowoc; J. A. Renggly, La Crosse; J. C. Reynolds, Geneva; A.

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J. Rodman, Darien; E. M. Rogers, Hartford; C. A. Rood, Reedsburg; W. W. Salladin, Reedsburg; J. C. Saltzman, Whitewater; W. H. Saunders, Kenosha; J. Schroendener, Kewauskum; G. Seiler, Alma; J. L. Shepard, Sheboygan Falls; J. J. Sherman, Marinette; H. C. Sibree, Peshtigo; G. L. Smith, Jefferson; J. E. Smith, Wonewoc; D. C. Spencer, Augusta; L. A. Squires, Poynette; T. F. Stair, Mazomanie; H. J. Stalker, Mauston; G. M. Steele, Oshkosh; E. Steiger, Prairie du Chien; G. C. Stockman, Ft. Atkinson; B. F. Strong, Seymour; L. Tabor, Stephensville; G. R. Taylor, Waupaca; H. J. Thomas, Greenwood; W. F. Tifft, Sheboygan; E. H. Townsend, New Lisbon; O. M. Twitchell, Madison; H. C. Van Arsdale, Saxville; J. H. Voje, Fredonia: S. R. Wakefield, West Salem; S. E. Webster, Friendship; H. P. Wenzel, Milwaukee; F. C. Werner, Watertown; M. Whinery, Rice Lake; J. B. Whiting, Janesville; W. F. Whyte, Watertown; J. Ll. Williams, Cambria; C. M. Willis, Berlin; G. F. Witter, Grand Rapids; M. Wood, Little Wolf; A. L. Wooster, Osseo; J. D. Wyatt, Phillips; A. Young, Prescott.

Besides the above named physicians the following have also furnished information of value in voluntary communications, sent to the secretary at various times during the prevalence of Small Pox: W. A. Anderson, La Crosse; J. E. Bacon, Waukesha; E. L. Boothby, Hammond; J. Cody, Watertown; H. E. Combacker, Osceola Mills; C. A. Culver, North Prairie; G. T. Dawley, Royalton; S. C. Farnsworth, Baldwin; C. H. Grannis, Menomonee; E. D. Horton, Valton; J. Panetti, Hustisford; J. A. Schmidt, Hustisford; C. W. Voorees, Lowell; L. Wade, Rockville; R. M. Wigginton, Watertown; J. J. Worthy, La Valle; L. Basford, Esq., Glen Haven; G. F. Bronson, Health Commissioner, Fond du Lac; T. G. Brunson, Esq., Prairie du Chien; Prof. J. F. Fuller, Depere; L. J. Hebard, Esq., Dayton; J. Noble, Esq., Reedsville; and A. Oaks, Esq., Burton.

The date of the earliest case reported in anwer to the

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circular of inquiry was July 8, 1881. This case was that of an immigrant who had contracted the disease either on ship-board or prior to embarkation from the old country, and was one of the few cases mentioned in our last report. The patient was promptly isolated, and in due time recovered without communicating the disorder to any one else; this favorable result was due to the wise precautions adopted by the attendant physician, seconded by the local authorities. This case occurred at Soldiers' Grove, and was reported by Drs. Dinsdale and Gott.

The second case occurred at Kenosha, exactly one month later, and likewise ended favorably. It was one of a number that originated, as was supposed, in a family the head of which did business in Chicago, whence a younger member returned home sick and covered with an eruption which the attendant physician called "a rare form of Eczema." It ran on until it became confluent and other members of the family were infected, when counsel was called in and the true nature of the disease discovered. "A large number were exposed and probably fifteen or sixteen cases resulted, five or six of them proving fatal. The public was notified, by placards on all infected houses, and all cases that could not be properly treated at home were removed to the pest-house. The success of these measures was as good as might have been expected," and the disease was finally stamped out. This outbreak also was referred to in our last report.

The earliest cases which have not been mentioned at all occurred in the city of Racine, and were twelve in number. About September 28, two cases were brought to that city from Chicago, the patients being children, one aged two years, the other about fourteen; neither had ever been vaccinated, and one died. Another case, that of an adult, independent of those just referred to in its origin, was the cause of a fourth instance, and others still followed. As the history of the disease in Racine will be given here-

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after in a communication from J. G. Meachem, M. D., it will not be necessary to pursue it further in this place.

It does not appear that there was anything like a general outbreak of Small Pox in Wisconsin until the month of November when the disease appeared almost simultaneously in widely separated localities; in Rock county, at Janesville, a tramp introduced the disease, the first case occurring in the jail at that place; the patient was promptly removed to the pest-house, together with all other inmates of the prison who had been exposed to the contagion, general vaccination was performed upon all officials and others connected therewith, the building and its bedding, furniture, etc., was carefully disinfected, and from this point the spread of the disease was effectually prevented. About the middle of November a family removed from Chicago to Janesville, and about a week after their arrival the man was taken sick; two practitioners were called to see the case, neither of whom was familiar with Small Pox, and neither of whom recognized the disease in the case before them; hence visitors were freely admitted for some little time; and when at last the nature of the disease became known, a number had been exposed. Four other cases resulted from this, one of them being one of the medical attendants who first had charge. The authorities now took action, isolation was enforced, disinfection and vaccination were practiced and the further progress of the disease was arrested. Dr. E. E. Loomis, Health Officer of the city, had charge of all preventive measures.

At about the same time the disease appeared in Rock county it broke out also in Manitowoc county. There were probably fifty or more cases scattered widely over this county, some of which will be more particularly mentioned hereafter, and it was not until the end of April, or the beginning of May, 1882, that the malady disappeared. A few days after Small Pox had made its appearance in Rock and Manitowoc counties, it broke out in Waupaca county also,

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where it was at first supposed to be Measles, an error in diagnosis which led to the exposure of many persons, with disastrous results. Other cases occured in Portage county during the same month, two at Stevens Point, both of which were in one family, and others at Junction City, about twelve miles west of Stevens Point; these cases were among some Polish immigrants newly arrived, and some of them probably received no proper medical treatment. The report received at the secretary's office says that in one instance, which ended fatally, "no effort was made to keep the patient isolated; on the contrary, other members of the family attended the public school, neighbors went in and out as in any ordinary case of sickness, and worse still, when death occurred public funeral services were held." Dr. Phillips, of Stevens Point, who had charge of the cases in that city above referred to, says that the account given is probably correct, adding that later on some attempts were made at quarantining Small Pox patients. That stringent measures were not taken in the beginning was probably owing to the fact that some uncertainty was felt as to the character of the disease, but that the condition of things above described was allowed to continue when the nature of the cases was established speaks loudly in condemnation of the local authorities, who possessed full power to interfere in the interest of the health of the residents, and were much to blame if that power was not exercised. We have information from several of our correspondents that the Poles and Bohemians generally object very strenuously to both vaccination and isolation, and that communities of those nationalities have been severely scourged by Small Pox in consequence of such objection.

At about the middle of November or a little later quite a large number of cases occurred in Waupaca county, of a portion of which Drs. Wood and Manchester give accounts. Dr. Wood had charge of fifteen cases in all, the first of which

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had been under treatment for Measles for some eight or ten days when Dr. Wood first saw the patient, having been called in as a consultant. In Ogdensburg the disorder was introduced by a stranger from the southern part of Wisconsin who developed Small Pox while staying at a tavern; this case also was pronounced Measles by the physician who was first called in, and soon afterward a quilting party was held at the house by which the disease was pretty widely spread over the townships of St. Lawrence and Little Wolf. Dr. Manchester had four cases and it is reported that others occurred in Iola, Dayton, and other townships in the same county; of these, if they really occurred, we have not been able to obtain the history. A single case, the origin of which could not be ascertained, occurred in the city of Appleton; it was conjectured that infected rags at one of the paper mills caused this case, a relative of the patient being employed in the sorting-room of one of these establishments. The case was strictly isolated and on its fatal termination the premises were carefully disinfected.

In December the disease was first seen in Columbia county, Dr. Davies of Columbus City having been called upon (December 2d), to visit a patient whom he found to be in about the fifth day of its development. About the middle of the month Dr. Finch, of Hillsborough, Vernon county, and Dr. Nichols, of Menomonee, Dunn county, each saw a case upon the same day; a few days later, at Fort Howard, Brown county, a young man employed as brakeman upon the C. & N. W. Railroad, brought the disease to that city from Chicago, and before the month closed it had made its appearance in Green Bay and Depere, both in the last named county.

At Ft. Howard, Dr. W. H. Bartran had four cases, all in one family, the original case having, as has already been said, contracted the disease in Chicago, where he "lay over

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one day on every trip; he came home feeling sick and in three days Small Pox developed itself. All the cases had been vaccinated in childhood, but the scars were not typical in any case; they were tolerably good in two instances, and both of these cases had only varioloid. Had we had an efficient Board of Health and a pest-house, we should have had only one case; as it was the family was quarantined immediately without waiting for the Board to be formally organized, the result being as above stated."

At Green Bay the disease was introduced by "a man who had been traveling, and was taken sick at Spaulding, Mich. He started south from that place and, his condition being discovered, was put off the train at Ft. Howard, whence he came directly to Green Bay, where, arriving at night, he was sent to the pest-house next morning. Several were exposed but only one took the disease from him. Vaccination was recommended, and made a necessary qualification for admission to the public schools; all persons who had not been vaccinated within five years were advised to test their susceptibility by re-vaccination. With a single exception, which was quarantined in his own house, all cases were lodged in the pest-house immediately on their discovery." A careful watch was kept upon all who were known to have been exposed to the infection, but no further cases occurred, and by the end of February the city was entirely free from the disease.

At Depere the outbreak was quite severe; Dr. Fisk reports that there were nine cases in all under his charge, but that the history of the first case is obscure, and its origin unknown. The authorities at Depere did not act with the promptness and decision evinced at many other places. The disease was first reported there on or about December 29, 1881. Dr. Fisk reports on January 20, 1882, nearly a month later, that there were then five cases in the village "with dilatory action on the part of the authorities," and on January

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24 he writes that "we have seven cases within the village. The first case was quarantined and cared for carefully. The second case was concealed in the village and not known to authorities or any physician till convalescence was fully established. The exposure of the community to the case kept quiet has been very general, and I expect additional cases to develop very soon." The case of which Dr. Fisk spoke as having been concealed until convalescence led to a very general condition of alarm and excitement among the residents; and the real number of cases then existing was much exaggerated.

"The Board of Health finally adopted a resolution providing that a physician should visit every house and satisfy himself that every person was properly vaccinated before February 10." At the time "some were frantically urging the closing up of the schools, but the cooler and less frightened urged their continuance making vaccination a prerequisite to admission thereto."

A few days later a correspondent from the same place writes thus of the discovery of another concealed case: "It appears that a young girl is just recovering who lives about three miles out, whose case has been kept secret, and it is supposed that the disease will go through the family, one of whom is a boy who has all along been attending one of the schools!"

There is ground for the belief that such concealment was practiced quite often in various parts of the state. While every allowance can be made for the affection which desires to care for a sick friend or relative at home, whatever the risk to the immediate attendants may be, hardly any words of condemnation can be too strong for concealing the existence of a dangerous contagious disease, and the sending members of a household in which such a disease exists out to carry on their usual and ordinary business among unsuspecting and unprotected persons constitutes a crime

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against society of a very grave character. Concerning this we shall have something more to say hereafter.

Several cases of Small Pox occurred during the same month (December) at Union Centre, Juneau county, whither it was brought "probably by a citizen who made frequent visits to Chicago; his wife was the first attacked, and, the disease being unrecognized until she was convalescent, his two children also contracted it." These were probably the cases referred to by Dr. Finch as having caused the disease in his practice at Hillsborough.

Still other cases occurred during the month of December in Richland county, where Small Pox probably manifested itself about the 24th or 25th. Dr. L. H. Nichol reports that the first case was probably exposed on or about December 10th, while travelling between some point in Kansas and the city of Chicago. Ten cases resulted from this, of which three were fatal; none of these individuals had been previously vaccinated, and Dr. Nichol says: "I vaccinated the whole family as soon as practicable; those upon whom the virus worked before Small Pox declared itself had the disease lightly and recovered; the others all died."

In January 1882 the disease probably reached its height; cases were reported by Drs. O. G. Lord, of Kaukauna, E. H. Grannis, of Menomonee, L. Grasmuck, of Menasha, E. H. Townsend of New Lisbon, W. H. Earles of Wrightstown, H. L. Jenckes of Glen Haven, I. J. Bennett of Jefferson, F. C. Werner of Watertown, N. M. Dodson and C. M. Willis of Berlin, D. P. Moriarty of Oconto, C. W. Voorus of Lowell, and others. The earliest instances of the disease reported in this month were in the town of Tainter, Dunn county, where there were in all six cases, the first occuring in a family then recently from Canada. The only means known by which the disorder could have reached them were letters from Canada received shortly before it broke out among them.

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A day or two after these cases seven others were reported in Dodge county, in the town of Lowell, whence Dr. Voorus wrote asking advice as to the propriety of keeping the public schools open, "one school-building being located about a block from a house in which all the patients above mentioned were lodged, and which building two-thirds of the scholars were obliged to pass on their way to and from school." It was recommended that the schools should be closed under the circumstances until the Small Pox cases should be removed from such undue proximity, and the building in which they were could be thoroughly cleaned and disinfected. Some days later Dr. V. wrote again requesting further information on some questions of disinfection and reported that the schools had been promptly closed upon receipt of the recommendation of the Board to that effect, and that it had been decided to require evidence of successful vaccination from every child as a prerequisite to admission upon their re-opening.

The cases reported by Drs. Dodson and Willis of Berlin were both very mild in type; Dr. Willis indeed expressed some doubt as to the one seen by him being really Small Pox; he saw it in consultation, and says of it, "Most of the symptoms were regular, but the child did not seem as sick as it should have been, considering that it had never been vaccinated, and convalesced very rapidly; still the family had been visiting where, undoubtedly, Small Pox existed." Both cases ended in recovery.

At or near Hilbert, about January 12th, members of a family in which the disease appeared went about for some days among their neighbors as usual. They were at length compelled by public sentiment (but not by public authority,) to take due precautions.

To East Holland, Brown county, the disease was carried by a man from Depere, and Dr. O. G. Lord reports fourteen cases as having been under his charge at that place, gener-

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ally ending in recovery. At Oconto a railroad laborer, who had contracted the disorder at some place in Michigan, introduced it, and here "the Health Board, though duly organized, was not advised of the existence of the disease until two fatal cases had occurred." This neglect was the cause of the spread of the malady until six cases had occurred in the practice of one physician; others also are reported of which we have no history. As soon as the Local Board became aware of the presence of Small Pox in the city prompt and vigorous action was taken, and from that time it ceased to spread; all the sick were rigidly isolated and thorough disinfection was practiced, with the best results. At New Lisbon there was one patient "who had been visiting Chicago, where doubtless he contracted the disease." To Glen Haven it came by way of Iowa; "the patient was here for some days," says Dr. Jenckes, "sick, without knowing what ailed him. He had been visiting his sister in whose family an eruptive disease called Chicken Pox existed, *with which many persons in that neighborhood had been very sick.* Two others in the same family contracted the disease in a mild form, but it did not spread."

Dr. Grasmuck, of Menasha, writes as follows: "A case of Variola was discovered here (Jan. 21) to-day in about the sixth day of its development. It had been kept hidden and many have been exposed; the disease was probably contracted at the paper mills. The people are Poles. I am vaccinating all and strict quarantine has been established." Subsequently Dr. G. furnished the facts which follow. "Two more cases of Small Pox have developed in the same family, a boy of 14 and a girl of 10. Both had been vaccinated, but subsequent to full exposure; I have learned that the boy had been exposed and hidden away afterward, and that the whole family had been visiting at a neighbor's, where they met a number of newly-arrived compatriots; I have some suspicion that the disease originated there, al-

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though I cannot trace the matter out as fully as I would like to. I have learned, however, that there was some sort of eruptive disease among them, but when they are pressed with questions they take refuge in ignorance and pretend that they don't understand any language whatever! I took a policeman with me and made them all comprehend what vaccination meant, and that they must all submit to that operation!

"There were quite a number of persons who said that the disorder was nothing but Chicken Pox, and one member of the city government complained that I was making a useless bill of expense for the city. Now, however, I hear no more about Chicken Pox, and I think they see the wisdom of my course.

"In these cases vaccination came too late to be of service, but the virus is working right along, surrounded by a big crop of Small Pox pustules, and apparently not at all affected by them."

At Wrightstown, where quite a large number of cases occurred, Dr. Earle reports that he was unable to trace their origin, but is inclined to the opinion that the germs of the disease were brought in infected clothing from the northern pineries.

Thus far Small Pox had been increasing in the number of persons attacked, although the number of cases resulting in death had not been very large, and during the month of February there was little, if any, prospect of a decline. On the 6th, Dr. Steiger, of Prairie du Chien, reported the first case occurring in his practice, and Dr. Dodge, of Lake Mills, reported another upon the same date. On the 7th, Dr. McComb, of Brillion, mentioned the occurrence of the disease in that vicinity.

February 11, Dr. D. C. Davies, of Columbus, wrote as follows: "The Small Pox trouble is over with us here, and although many were exposed, only two, both in the same

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family, came down with it. This favorable result can be accounted for only by the cleanliness, intelligence and obedience of the family. The parents followed instructions implicitly, and no further danger is to be apprehended from the visitation. The two boys are badly marked, as neither had ever been vaccinated."

On February 13, Dr. W. F. Whyte wrote from Watertown that "Two cases of Variola have made their appearance here, both imported from Chicago. Vaccination has been quite general this winter, but still many are unprotected. If the disease should spread would it not be advisable to close the public schools? I told the superintendent of schools to-day that I thought every child attending the schools should bring a certificate of recent vaccination."

Dr. Reynolds, of Geneva, was called to visit a patient with Small Pox, February 17th, and Dr. Mahneke, of Hilbert, records the appearance of the disease in his practice on the 27th.

In the city of Madison the disease appeared about February 23, a stranger who had contracted the disease in Chicago being the means of its introduction. It is thought that, but for the mistake of allowing an unvaccinated man to assist in the burial of the first patient, the disorder would have been confined to a single individual.

The outbreak at Prairie du Chien was traced directly to Chicago, where a lady had attended the funeral of a relative dead from Small Pox; "ten days after her return one of her children came down with the disease; when I was first called in to see the case many friends and neighbors had been in to visit and sit up with the patient." During the existence of the malady at this place a resident distinguished himself by an extraordinary act of foolish bravado; a lady being very sick with Small Pox, the house placarded and every method taken to warn the public away, this individual entered the premises, made his way to the sick room, where

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he sat down by the bedside and read a postal card to the patient, all this being done apparently with no object other than that of running the risk of taking the disease himself and communicating it to others. Four cases in all are reported as having occurred in that city.

At Lake Mills "the first patient, a young man of twenty-six, contracted the disease by sleeping with a man just recovering therefrom, not knowing what his bed-fellow was affected with." Six cases occurred at this place, all ending in recovery.

At Geneva "a farmer contracted the disease while spending several days in the stockyards at Chicago; this man communicated Small Pox to his wife and to two of his hired girls, the latter, in their turn carrying it home to their own families."

At Hilbert "a peddler who had the disease came to the house of a resident to sell his wares; he took dinner with the family, who were, of course, totally ignorant of the dangerous character of the guest they were entertaining. The boy who sat next to him at table came down with Small Pox some ten or twelve days thereafter." There were twenty-three cases reported as occurring at this place and its vicinity. A pedler traveling from house to house and spreading out his goods for examination and handling at many places would prove a very efficient agent in extending Small Pox or any other contagious disease.

Dr. McComb, of Brillion, reports having had ten cases under his care. "It was brought from a neighboring village by a family visiting there, by some of whose members it was contracted. The disease existed for two or three days before it was discovered; as soon as it was known, however, strict quarantine was enforced."

At several localities in Calumet county the disorder was quite prevalent; concealment seems to have been practiced

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here also in several instances, with the usual disastrous consequences.

During the month of March the disease seemed to be declining; Dr. Stalker, of Mauston, reports the first case on the 2nd of that month, the only one in his practice. March 7th a case occurred in Janesville under the care of Dr. J. B. Whiting, but the authorities here were vigilant and active, and this outbreak seems to have been soon checked; Dr. W. says that the "efficient mayor, Mr. Lovejoy, rendered valuable aid in the matter, and the success with which restrictive measures were carried out was almost perfect." Dr. Hittner, of Mishicott began the treatment of the disease in that neighborhood, though not in that town, on the 4th. On the 10th Dr. Squires, of Poynette was called to the first case in that neighborhood; a medical student, brother to the patient, who had acted as nurse in the Small Pox hospital at Chicago, was probably the medium of its introduction here; two cases in all, both from the same family, are reported from this place. Dr. Currens, of Two Rivers, reports its first appearance in his practice on the 20th; and on the 22nd Dr. J. E. Bacon, of Waukesha, mentions a case that had appeared a day or two before in the county jail, the subject being a tramp confined therein. March 24th Dr. J. H. Voje, of Fredonia, records its appearance, and Dr. Dodge, of Menasha, first had it to deal with on the 27th.

The case at Mauston originated as was supposed either from exposure at Chicago or between that place and Mauston. At Fredonia "the first patient while in attendance at court at the county seat had slept for several nights at a hotel; two other persons occupied the same room, one of whom, it was afterwards learned, had come directly from a family in which Small Pox existed."

The disease in Manitowoc county, was spread largely by a concealed patient in regard to whom we have the following facts from a correspondent in the vicinity. No less than

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six families in one town were affected, Small Pox having been spread by means of a case for a long time kept secret, the other members of the family mingling freely the while with their friends and neighbors; the head of the household even had a "raising-bee" to which he invited a large party, while one of the members of his family, if not two, were lying sick with Small Pox. Reports being freely circulated to that effect, the Health authorities of the place at length took steps to verify or disprove the rumors, with the result of finding two patients then concealed in the house. Proper quarantine measures were instituted immediately and further exposure prevented, but not until a large number of persons had unknowingly run the risk of contracting the malady, and its germs had been spread broad-cast. Among those who took the disease, and to whom it proved fatal was one of the officers who made the examination that resulted in its discovery; it is greatly to be regretted that exemplary punishment was not inflicted upon the person who wilfully exposed the community in which he lived to so great a danger, which might have been done under section 4 of chapter 168 of the laws of 1881, which provides that any person who shall in any way knowingly and wilfully subject others to danger of contracting Small Pox, Diptheria, &c., shall be liable upon conviction to a fine of not less than fifty or more than three hundred dollars.

The origin of the disease at Two Rivers, in Dr. Curren's practice, it was impracticable to trace with certainty. "The patient had not been out of the city for thirty days previously, no cases had existed up to that time, (March 20th,) and he had no knowledge of having been exposed. The only channel through which it seemed that might have reached him was by means of some of his fellow-countrymen, Bohemians, of whom several parties had called on him during the spring to act as interpreter. While it is not known that any

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one of these had Small Pox, this is the only discoverable explanation."

In April, the number of cases declined perceptibly. From the concealed cases in Manitowoc County, already referred to, the disease continued its spread until about April 25th, after which date no instances occurred that could be fairly traced to that cause. The earliest instance reported for the month was by Dr. Boothby, of Hammond, and made its appearance about April 8th, although the date is somewhat uncertain, as no physician was called in to the first case, the nature of the disease having been apparently unsuspected until many had been exposed.

The history as ascertained by Dr. Boothby is an illustration, apparently, of the recklessness, or worse, of the agents of certain transportation companies referred to in a former report of this Board; the facts being, as nearly as they could be learned under the difficulties that presented themselves, as follows: A party of emigrants left Copenhagen, Denmark, on a steamer of the American line, the name of which is not given, arriving at Philadelphia about March 29, 1882. On board this vessel was a passenger who was said to be sick and was visited by the ship's surgeon only, the nature of his disease being kept secret. When the vessel reached Philadelphia, all the passengers were vaccinated, and, without further precautions or quarantine detention, were put on board the cars and started off with all possible haste for their destinations, one party, three in number, being bound for Baldwin, in this state, where they had relatives; this party, with which we have to do, reached Baldwin April 1st, four days after landing at Philadelphia, and one week thereafter the eldest member, a woman of about 56, was taken with Small Pox, of a type so mild, however, that no physician was called in, and the woman apparently went about as much as usual, although the eruption was plainly marked. A second member of this party, a woman of about

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20, went to visit a relative who lived some ten miles away three or four days after their arrival, and while there came down with Small Pox. Next, a son of the woman first mentioned, who had been in this country some time and had visited his mother soon after her arrival and during the sickness above mentioned, complained of being unwell and medical advice was sought. It unfortunately happened that both of physicians residing in the neighborhood were absent from home; an irregular practitioner was hence called in, who at first pronounced the disease Typhoid, and at a second visit called it "Black Measles." This man was soon after dismissed from attendance, the patient and his relatives accepting his diagnosis, and thinking that if the disease were only Measles the further services of a medical attendent would not be necessary.

Meanwhile the young woman before spoken of as having gone away to visit a relative, had come down with Small Pox, and others had taken the disease from her, no physician having been called in. The local authorities of the town in which she was staying had heard rumors of an eruptive disease "like Measles, but much worse," and had requested Dr. Farnsworth to investigate the cases and report. At about the same time Dr. Boothby was called to see a sick babe belonging to the family with whom the young woman was staying, which babe had been placed temporarily with a neighbor for care while there was so much sickness among its own people. Thus it happened that both Dr. Farnsworth and Dr. Boothly diagnosed Small Pox in two cases at almost the same time, both cases being virulent in type. Remembering the case of reported "Black Measles" near his own home, Dr. Boothby at once suspected its true nature and, reporting his suspicions to the town board, he was authorized to investigate, which he did, the result being the discovery of a case of Small Pox a week old, and of the facts already given concerning previous cases.

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Strict quarantine measures were at once instituted in both localities, but the disease had already been contracted by others who had been exposed, and, although vaccination was promptly performed upon all in the houses and in their vicinities, others still came down, the last case occurring May 18, ending in recovery.

Dr. Boothby says: "The parties were all Danes and but few of them spoke English; those who knew the most concerning the sickness were new-comers and spoke no language but their own, hence the difficulty of obtaining intelligible information was great. I could not learn the name of the steamship, nor did they know over what railroad they travelled from Philadelphia to Chicago; from Chicago to Baldwin, however, they came by the Chicago, St. Paul, Minneapolis & Omaha railroad. They cannot, of course, tell what it would be very interesting to know, how many of their fellow-travelers were attacked by Small Pox after leaving the ship, or whether the case of sickness on shipboard, which was Small Pox almost beyond doubt, was the only one. If this case were not Small Pox why the hasty vaccination on arriving at Philadelphia,—a vaccination which proved useless in the case of these three persons—and whence otherwise came the disease which caused the death of five unvaccinated persons out of the twenty-four who took Small Pox here?" Certainly there seems to have been criminal negligence or criminal concealment on the part of some one, though whether it were the ship's officers or the inspecting officers at the port of Philadelphia cannot perhaps be certainly learned at this late day. "The story carries its own impressive lesson with it; the unprotected died, those who had been vaccinated, even though imperfectly, escaped with their lives, although some of them were dangerously sick."

The next case in order of time reported in April was in Sheboygan and was a newly arrived immigrant also; his

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nationality was not mentioned. Dr. E. Le Sage whose patient he was, says that he had been only ten days in the town when the malady declared itself.

At Hustisford in Dodge county a case occurred about April 23d, in a hired man newly arrived from Germany, though he contracted the disease, it is thought, after his arrival in Wisconsin. A little while afterward another case appeared in this place in the person of a young girl. Some attempt at concealment or denial of the character of the disorder seems to have been made in this instance, but some of the neighbors becoming suspicious reported the case to the authorities who desired Dr. J. A. Schmidt to make an examination thereof; this being done, a diagnosis of Small Pox was made, and Dr. Schmidt thenceforward took charge. Five other cases followed, one proving fatal. Later on a man from Juneau again introduced the disease, and three other cases resulted which were treated by Dr. Panetti, all ending in recovery.

On the 26th, Dr. Clemmer, of Juda, had a patient, also a newly arrived immigrant, come under his care, and on the 29th Dr. B. J. Merrill had charge of a case at the city of Hudson. On the same day Dr. Bacon reported "another inmate of the county jail at Waukesha developed Small Pox and was immediately removed to the building appropriated for a pest-house." "There have been no other cases since the one reported over a month ago. In both these instances the cells at the jail were immediately cleaned out, fumigated, whitewashed, and the other inmates were vaccinated. This patient had been incarcerated sixteen days when the disease manifested itself."

During this month of April Small Pox appeared also at Lynn, Clark county, where it was introduced by a man just from Montana. The practitioner first called in was one "who, when asked for his diploma, could only show a certificate of attendance upon a course of lectures with the word 'Diplo-

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ma' written across its face;" this person pronounced the disease to be "Stone Pox," but an intelligent layman hardly satisfied with this diagnosis, notified the chairman of the town board, *who, after some others had sickened,* called in Dr. Morley, of Neillsville, who found the disease to be Confluent Small Pox. Strict quarantine measures were now instituted and the disease spread no further; six cases in all resulted from the exposure at first, with one death; it is very probable that, had proper medical advice been had at the outset, the malady, would have been confined to the original patient. These ten were all the cases that were reported during April.

The first case reported for the month of May was a most instructive one; it occurred at the city of Hudson under the care of Dr. Merrill, whose graphic account we quote as follows: "The case was that of the man employed as a nurse for the first patient; he began nursing May 3d, and died May 20th. The first man was a tramp who had been circulating through Iowa, Minnesota and Wisconsin; when the disease manifested itself he was in the pineries on the Northern Wisconsin Railroad and came thence to Hudson; the character of his complaint was recognized immediately upon his arrival, and he was sent to the pest-house. On the 2nd of May a patient having a very suspicious-looking eruption presented himself at my office; physicians who saw him deemed it prudent to send him also to the pest-house for further observation, which was accordingly done; I took the precaution to vaccinate him thoroughly before he went; the vaccination took well, worked in a typical manner, and, his eruption disappearing in three or four days, he was discharged and went to his home seven miles in the country, and has had no symptom whatever of Small Pox. He had never been vaccinated before and furnished a very good illustration of what vaccination will do.

"The nurse employed by the Health Board for the first pa-

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tient went into the pest-house on the same day; he had never been vaccinated, but asserted that he had had Varioloid when a small boy; it proved afterward that it was only Chicken Pox that he had been affected with. On the sixth day thereafter the first symptoms of Small Pox made their appearance in him, and on May 20th he died. Here we have vaccination and no vaccination fairly contrasted. First, a pest-house. Second, an inmate with typical Small Pox. Third, the advent of two other inmates, both robust young men on the same day, the one vaccinated, the other wholly unprotected by vaccination; the one as patient, the other as nurse; the one with a suspicious eruption, the other asserting positively that he had had modified Small Pox when a child. Fourth, the inmate with suspicious eruption is discharged in three or four days, his vaccination working well; he goes home and has had no sign of Small Pox since, though carefully watched. Fifth. the unvaccinated, unprotected nurse takes Small Pox in a virulent form and dies, Finale: At midnight the doctor and the original patient, now convalescing, bury the dead nurse. The whole furnishes an illustration with no complicating factors eminently fit to be laid before the reasoning faculties — if any such there be — of all anti-vaccinationist societies."

May 6th, the disease appeared in the practice of Dr. Ira Manley, of Mankesan, who had in all sixteen cases. It originated among a party of seven emigrants from Germany; "a babe belonging to one of these had been vaccinated on ship-board, but it had failed to work; the child took Small Pox, which was called Chicken Pox, and received ne treatment whatever, nor was any precaution taken. Dr. Manley was called in to see one of the women of the party soon after they reached the neighborhood of Markesan, and found her and her two boys with Small Pox eruption just appearing. The woman had Varioloid only, but the boys

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had unmodified Small Pox and one died. Dr. Manley took the responsibility of advising the immediate closing of the school, *which the boys had been attending up to this time*, and notified the town board, which, although unorganized at the time, took prompt measures for the suppression of the disease. Dr. M. was authorized to take whatever steps he deemed best, and a vigorous quarantine was at once instituted. No less than thirty-seven persons had been exposed, however, all Germans, *and every unvaccinated one among them took the disorder.*

Small Pox next showed itselr at Juneau, Dodge County, where Dr. Hallock had charge of eleven cases in all, of which number one proved fatal. There was a good deal of excitement in the village, owing to the fact that one of the cases occurred near the business center, and applications were made by several citizens to the State Board, apparently under the impression that powers could be exercised by it which are lodged exclusively, and wisely, in the hands of the local authorities. Three families were affected, the original case occurring in a boarding house, to which some newly-arrived German immigrants had come, one of whom was suffering under Variola; the character of the disease was not suspected, however, until the landlord's son came down with it, and when a proper diagnosis had been made in his case, many had been exposed and the excitement was very great. "A man who had stopped at this house for a few days, *en route*, carried the disease to Hustisford, where a case is reported under the care of Dr. Schmidt, and other cases in the neigborhood of Watertown. Still another case is reported at Horicon." These cases extended through the months of May and June, about the 20th of which latter month Dr. Hallock wrote that there were still some Small Pox patients in the village, but that all were well under control, and there was no further apprehension of the spread of the malady.

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Secretary's Report.

On May 15th, a case of Varioloid was reported at Wonewoc, under the care of Dr. J. E. Smith; its origin was not given. At about the same time a telegraphic dispatch was received by the President of this Board saying that Small Pox existed in a very bad form at Mather, a little settlement in Juneau County, on the Wisconsin Valley branch of the Chicago, St. Paul and Milwaukee R. R.

The facts in the case appear to have been as follows: When Small Pox first made its appearance at Mather's a resident at that place who is a practitioner of medicine to some extent, attended the case until its character was certainly asscertained, when he called upon a physician from a neighboring town, who went thither, saw the patient and gave general directions for the treatment, but not until after an unknown number of persons had been exposed. All of the members of the family in which the first case appeared came down with the disease, and the resident practitioner first mentioned took charge of them, and of all subsequent cases. Dr. Stannard of Tomah was requested by the commissioners of the poor in that township to go to Mather's, but his engagements did not admit of his doing so, except on a single occasion, when he vaccinated to hands employed in a sawmill, "and saw the practitioner in charge of the Small Pox case, talked with him about it, but was not asked to see it."

After the month of May the force of the disease appeared to have been broken, inasmuch as comparatively few cases were reported. During June all that we have to record are the following: Dr. Regan, of Oconomowoc, had four cases under his charge, the first occurring June 1st. This patient, a resident of Oconomowoc or its vicinity, had paid a business visit to Dodge county, where he contracted the disease at a hotel, and coming home communicated it to his wife and two children, one of whome died.

In addition to the cases above reported there were a num-

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ber from various places, the dates of which were not given. One of these occurred in the city of Oshkosh, probably during the month of January; the patient was a tramp, confined in the county jail, who had, according to his own statement, contracted the disease from some of his vagrant associates, at some point either in Illinois or in the southern portion of Wisconsin. He was promptly removed to a pest-house where he died. The other inmates of the prison were vaccinated, the building and its furniture were disinfected and precautionary measures taken with such good effect that no other case appeared either there or elsewhere in the city. At Union Center, Dr. Gilluly had charge of four cases, probably those referred to by Dr. Finch in December, as having been the source from which Small Pox originated in his practice. These cases, it was thought, were caused by infection brought in clothing from Chicago, the gentleman in whose family they occurred being engaged in shipping produce to that city, to which he had paid a visit shortly before the appearance of the disorder. His wife was the first to come down with Varioloid, and his two unvaccinated children contracted unmodified Small Pox from their mother. It was not until several days after the outbreak that the health authorities of the town were notified, but when made aware of the existence of Small Pox in their jurisdiction, their action was prompt and vigorous, and its further spread was prevented.

At Portage City Dr. Meacher reports two cases of Small Pox, both patients being children, and both recovering. Dr. M. also says: "I heard of some other cases, but whether they were cases of Small Pox or Chicken Pox I am not able to say; I incline to the opinion that they were only Chicken Pox, as I saw some cases of that disorder about the time that Variola was talked about, which might have been easily mistaken for Small Pox by an inexperienced practitioner. The father of the two children above spoken of is a carpen-

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ter in the employment of the R. R. Co., and spends much of his time on the road."

Dr. Salladin, of Reedsburg, reports six cases, three of which were confluent Small Pox, and ended fatally. The malady here originated in a case of Varioloid. The patient suffering under it came from Chicago, and communicated the disease in its more severe form to the unprotected friends with whom he stayed. The Local Health Board acted promptly and energetically, ordering the closing of all churches and schools, and prohibiting, for the time being, any public assemblies. These measures, together with the strict quarantine instituted, entirely prevented the spread of the disease. There were many, especially among the Bohemian part of the population, who were disposed to resist the enforcement of the regulations of the Health Board, "and to rely on religious processions and other ceremonials rather than on vaccination as a safeguard against the disorder."

Dr. Witter, of Grand Rapids, reports four cases as having been under his care in that neighborhood, one ending fatally. Dr. Reed, of Jefferson, also reports four cases, all terminating favorably; all of the patients had been vaccinated in infancy it was said. Two members of the family who had never been vaccinated until the disease declared itself in their relatives, were protected thereby and escaped entirely. A young man employed as a laborer upon a railroad in Iowa brought Small Pox thence to this place.

In addition to the cases thus far mentioned there were fifty-four in the city of Milwaukee, the first occurring April 1, 1881, and having been, together with two others which followed it, mentioned in the last report of this Board. Next to these, and the first properly belonging to this account, a case occurred on July 12, from clothing brought to the city by immigrants newly arrived; two other cases resulted from this. September 6th a case was imported from Chicago which gave rise to two others, and on each October

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1st and December 2nd a case was discovered, one in the hospital, the other coming from Chicago. December 29th a case came from Chicago which caused four others, and on March 3d, 1882, one, the origin of which was not ascertained, communicated the disease to five other persons. Many of the remainder were newly arrived immigrants, a few were tramps, and in one case it was supposed that a physician communicated the disorder to one of his patients. The last case occurred July 7th in the person of a newsboy employed on one of the railroads running between Milwaukee and Chicago. This was the last case reported in Wisconsin, and it is hoped that Small Pox as an epidemic is now over throughout the state.*

For more convenient reference we here present a table embracing all the cases hitherto mentioned with the name and address of the physician reporting, the date of the first case and the number of deaths:

Name of Physician reporting.	P. O. Address.	No. of cases.	No. of deaths.	Date of first case.
R. Martin	Milwaukee	51	.....	July 12,1881
T. Gillespie	Kenosha	1	.....	Aug. 8,1881
J. G. Meachem	Racine	13	2	Sep. 28,1881
R. S. O'Connell	Cato	18	4	Nov.—,1881
J. Phillips	Stevens Point	1	.....	Nov.—,1881
E. E. Loomis	Janesville	5	.....	Nov. 6,1881
D. L. Manchester	Waupaca	4	1	Nov.23,1881
M. Wood	Little Wolf	15	4	Nov.29,1881
D. C. Davies	Columbus	2	.....	Dec. 2,1881
F. Pinch	Hillsborough	5	1	Dec. 18,1881
W. F. Nichols	Menomonie	10	4	Dec. 18,1881
L. H. Nichol	Chetek	10	1	Dec. 21,1881
W. H. Bartran	Fort Howard	4	1	Dec. 22,1881
M. F. Owen	Cedar Falls	6	2	Dec. 25,1881
B. C. Brett	Green Bay	6	.....	Dec. 29,1881
M. H. Fisk	Depere	9	3	Dec. 29,1881
G. Rood	Stevens Point	16	3	Jan. —.1882

* A case has been reported at Kewaunee occurring October 8th, originating in Chicago, but up to the present time no other has resulted from it.

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Secretary's Report.

Name of Physician reporting.	P. O. Address.	No. of cases.	No. of deaths.	Date of first case.
F. C. Werner	Watertown	1	.....	Jan. —,1882
C. M. Willis	Berlin	1	.....	Jan. —,1882
N. M. Dodson	Berlin	1	.....	Jan. —,1882
D. P. Moriarity	Oconto	6	3	Jan. —,1882
I. J. Bennett	Jefferson	1	.....	Jan. —,1882
L. Grasmuck	Menasha	12	1	Jan. 1,1882
C. W. Voorus	Lowell	7	.....	Jan. 2,1882
E. H. Townsend	New Lisbon	1	.....	Jan. 21,1882
W. H. Earles	Wrightstown	17	4	Jan. 29,1882
O. G. Lord	Kaukauna	14	.....	Jan. 7,1882
H. L. Jenckes	Glen Haven	1	.....	Jan. 30,1882
F. H. Dodge	Lake Mills	6	.....	Feb. 6,1882
E. Steiger	Prairie du Chien.	4	1	Feb. 6,1882
I. W. McComb	Brillion	10	1	Feb. 7,1882
W. F. Whyte*	Watertown	2	.....	Feb. 13,1882
J. C. Reynolds	Geneva	11	4	Feb. 17,1882
O. M. Twitchell	Madison	1	1	Feb. 23,1882
C. Mahneke	Hilbert	23	4	Feb. 27,1882
H. J. Stalker	Mauston	1	.....	Mar. 2,1882
H. M. Hittner	Mishicot	20	2	Mar. 4,1882
J. B. Whiting	Janesville	7	.....	Mar. 7,1882
L. A. Squires	Poynette	2	.....	Mar. 10,1882
J. R. Currens	TwoRivers	1	.....	Mar. 18,1882
J. E. Bacon	Waukesha	2	.....	Mar. 20,1882
J. H. Voje	Fredonia	2	.....	Mar. 24,1882
G. W. Dodge	Menasha	2	.....	Mar. 27,1882
W. B. Morley	Neillsville	6	1	Apr. —,1882
E. L. Boothby	Hammond	24	5	Apr. 8,1882
E. LeSage	Sheboygan	2	.....	Apr. 19,1882
J. A. Schmidt	Hustisford	7	1	Apr. 23,1882
J. N. Clemmer	Juda	1	.....	Apr. 26,1882
B. J. Merrill	Stillwater, Minn.	2	1	Apr. 29,1882
S. C. Farnsworth	Baldwin	6	2	May —,1882
I. Manley	Markesan	16	2	May 6,1882
W. E. Hallock	Juneau	11	1	May 13,1882
J. E. Smith	Wonewoc	1	.....	May 15,1882
J. Regan	Oconomowoc	4	1	Jun. 1,1882
J. Panetti †	Hustisford	3	.....	July 1,1882
T. Galluly	Union Centre	3	.....	No date.
G. F. Brownson	Fond du Lac	3	2	No date.
J. C. Noyes & G. M. Steele	Oshkosh	1	1	No date.
W. W. Reed	Jefferson	4	.....	No date.
N. W. Salladin	Reedsburg	6	3	No date.
G. F. Witter	Grand Rapids	4	1	No date.
W. Meacher	Portage	2	.....	No date.

*Probably one of these cases was that reported by Dr. Warner, in January.

†The date here given is almost certainly erroneous.

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PRACTICAL LESSONS FROM THE EPIDEMIC.

Prominent among the lessons taught by the outbreak of Small Pox, which now seems happily ended, is the one that vaccination, properly and skillfully performed, is a certain preventive of the disease, and that vaccination, even when unskillfully done, diminishes the danger to a very great extent. Of the four hundred cases and more, of which we have the history directly from their medical attendants, comparatively few had undergone this beneficient operation, and of these few a still smaller proportion suffered from unmodified Small Pox. Here are some of the testimonies given by physicians in various parts of the state. "My first case was a young lady who had been vaccinated fifteen years before; she had only Varioloid; another was a girl of eight, vaccinated ten days before attack; she also had Varioloid lightly. No case proved fatal where vaccination had been performed." "One of my cases had never been vaccinated until I vaccinated him shortly after exposure; he had only a light form of Varioloid and did not keep his bed for a day." "All of my cases had been vaccinated in infancy, but the operation had never been repeated; all recovered, and the type of the disease was mild. Two members of the family, whom I vaccinated after the appearance of the disease in the household, did not contract it at all." "Six of my cases had been vaccinated at periods varying from eight to fifteen years before they contracted the disease; none of these cases proved fatal." "One case had been vaccinated about fifteen years before; he showed a very small and imperfect mark only; he recovered." "Two boys, brothers, had never been vaccinated; the rest of the family had been, at dates ranging all the way from five to forty years previously; all the vaccinated escaped the disease, although they had been confined to the house for nearly two months. Some dozen persons were exposed." The following account is especially instructive: "I was

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called to see a sick child, and found upon my arrival a babe, dead, a second child three years old having high fever and the mother of both with severe headache and nausea. The infant had been sick but a few hours and had died in convulsions; next day the other child and the mother had well marked Small Pox eruption. The child recovered and the mother died. In the same family was a little girl of five years old whom I vaccinated at once, and repeated the operation three or four times. In about ten days her arm became sore, but she came down with Small Pox also; her attack was very light, however, and she recovered nicely." "But a more striking case was that of a man who showed a good vaccination scar; he had only Varioloid, and his family six in number, all refused to be vaccinated. *They all came down with unmodified Small Pox*, and the mother and eldest daughter died."

The evidence in fact, all tended one way; examination of the reports received shows that among the deaths from Small Pox in this state, seven only were of individuals who had been vaccinated, while but two cases of unmodified Small Pox are specifically returned as being among the protected class; it is to be borne in mind moreover, that all who even claimed to have been vaccinated are included in this class, even though no evidence in the shape of a vaccine scar was to be found upon them. "One case, that of a newly-arrived German whom I treated, claimed to have been vaccinated in infancy, but I could discover no mark." "One individual said he had been vaccinated fifteen years before, but showed only a small and very imperfect mark." "The adults were generally tramps, and, although they asserted that they had been vaccinated, not one of them had any typical scar." "All four of my patients had been vaccinated in childhood, but the results were not typical; their ages ranged from sixteen to forty-eight, one only being under twenty; this youngest patient and his father showed the

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best marks, and they had only Varioloid." "My single case was vaccinated, but subsequent to exposure, and the disease had too much the start for vaccination to be altogether successful." "Two children were vaccinated about ten days before they came down with the disease, and one woman who died was pregnant at the time she contracted it; she also had been vaccinated but a short time previously." Had such cases as these been excluded from the list of the vaccinated it would be found that not a single case of death or of unmodified Small Pox had occurred in that list; it is, however, one of the strongest evidences of the great benefit of the operation, that even with all these and others similar in kind, but of which no specific mention has been made, included, the number is so small that it may well be said that the history of Small Pox in Wisconsin during the years 1881 and '82 has added one more to the already abundant proofs of the efficiency of vaccination as a protective against that disease; even in instances where the operation had been performed so long before that its effect might have been thought exhausted, it still showed its power to modify the disorder and render its course milder than would otherwise have been the case, while in other instances in which vaccination had been delayed until after the exposure to the Variolous contagion, it still manifested its ability either to render the poison wholly innocuous, or to so mitigate its virulence that little or no danger to life resulted therefrom.

A second point worthy of careful attention is the certainty with which Small Pox was controlled by the adoption of proper quarantine measures when once its true character was discovered in any given place, and such measures were enforced by the local health authorities. The testimony on this point is emphatic and unanimous. "Measures for preventing the spread of the disease were carried out with perfect success." "It was confined to the families in which it originated, no one else being even exposed. Within two

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hours after the existence of the disease was known to our board the patient was lodged in the pest house and the spread of it was entirely prevented." "One single case was removed to the pest house as soon as the eruption was seen, and all who had been exposed were vaccinated, their clothing, etc., properly disinfected, and they themselves duly watched until all danger was over. These measures were attended with perfect success." "Five cases appeared all in one house which was placed under strict quarantine; all who had been exposed were vaccinated, disinfected and kept under medical observation for a sufficient length of time. Success was complete and no other cases occurred from this center of infection." "Our board has had for some years past a well fitted Small Pox hospital always in readiness for use, in a field about a mile from the town, and has always known where efficient nurses could be had in case of any emergency. Fortunately the disease did not visit us, but had it done so there is no doubt that its spread would have been absolutely prevented."*

Such quotations as these might be extended almost indefinitely; in every case where the Local Health Board was properly organized to meet and cope with the disease, its spread was surely prevented, no one felt any particular alarm, and the business of the place went on without interruption. On the other hand, wherever the Local Board was unorganized, or being organized was slow to act from any cause, Small Pox spread more or less widely, the citizens became anxious and excited, general fear prevailed, and trade received a check from which it did not soon recover. Evidences of these conditions was received, at times quite frequently at the office of the Secretary of this Board, in the shape of telegraphic and other communications, from vari-

*The above communication is from Dr. J. J. Sherman, of Marinette. The condition of readiness described therein is as praiseworthy and as economical as it is unfortunately rare.

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ous parts of the state, urgently asking for advice or assistance, the malady having appeared in their midst, and the Local Board being wholly unorganized, and thus unable to take any steps legally for its confinement and suppression, or else failing to act, perhaps from timidity, or from ignorance of its own powers. "Our Board was very slow to act, but finally did some good work in the way of quarantining infected houses. The measures taken were only partially successful, and better results would have been reached had the organization been more perfect." In the town of which this is said, there were many cases with a mortality of one-fourth of the whole number. "The Health Board was not organized, nor is it organized even now. Everything was left to the attendant physicians, and success in preventing the spread of Small Pox was only moderate. Better results would almost certainly have been reached had the organization of the Board been effected properly and seasonably." Twelve cases appeared in the care of the physician making this report in one town, "nearly all of which were small children, and not one over eighteen years old;" another practitioner had several cases in the same place, and there is reason for the belief that others occurred which were carried through to their termination without being seen by any physician, which were not isolated, and which were the means of spreading the infection through several adjoining townships. "We had no legally organized Board; had such a body been in existence and provided us with a proper pest-house, we should in all human probability have had but a single case of Small Pox; as matters stood, we had four." Many such pieces of evidence might be presented, all tending to show the same thing, viz.: that wherever the Local Board of Health was properly organized beforehand, or was in such shape that organization could be effected and prompt action taken, Small Pox was confined within narrow limits, and was soon stamped out at compar-

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atively little trouble and cost. Wherever, on the contrary, no efficient organization was had, or where the local authorities were timid, the disease spread rapidly and widely, and the cost of its suppression was usually large and lives were sacrificed that might well have been saved.

Another point still, is the fact that no period of life was exempt from attack if the individual were unvaccinated. Persons of advanced age and newly-born children were alike liable to be seized upon. Our reports show that of the whole number of cases embodied therein, about seventeen per cent. were children under five years of age, the youngest being but a few hours old; about thirteen per cent. were from five to fifteen years old; twenty-three per cent. between fifteen and twenty-five; thirty-two per cent. between twenty-five and forty; and fifteen per cent. over forty years of age; the oldest being a man of seventy-eight, and two others upwards of seventy. Thus, it is evident, that Small Pox has little preference for one age over another, but that all ages alike, if unprotected, are obnoxious to seizure.

RISK OF COMMUNICATING DISEASE BY VACCINATION.

By far the larger proportion of our medical correspondents are decidedly of opinion that no disease other than the protective affection which it is the aim and object of the operation to impart, can be communicated from one individual to another by means of vaccination. Their language is as emphatic upon this point as language can well be. "I have never had any such experience, nor do I think that such a thing can possibly happen." "I never had knowledge of any disease except the vaccine being communicated by vaccination, and I never expect to have." "Have never seen such a case nor do I believe one to be possible." "Never knew of any such thing." "Years ago I was employed in a hospital where Syphilization was practiced, and I believe, from my observation there, that a true vaccine pustule taken

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from a Syphilitic patient, will produce vaccinia, but not Syphilis." "A case of the communication of disease by means of vaccination has never come under my observation." "I doubt that any other disease can be produced by means of vaccination." "I have never seen an instance of the communication of any disease by means of vaccination, and I hope that physicians will give careful attention to this matter, since it is the fear of such communication which gives rise to much of the opposition to the operation." Such are the expressions used by the large majority of the physicians of our state upon this subject; there are some who do not speak quite so strongly, but the general drift of their testimony also is in the same direction. "I have known instances," says one, "where virus of questionable purity has produced phlegmonous swellings, but I have never known specific disease to be so produced." Says a second, "I have suspected that disease which was already dormant in the system has sometimes been brought into activity by vaccination, but I have never seen disease communicated from one individual to another thereby." "I saw while serving in the army, some dreadful ulcers which it was claimed were the results of impure vaccine virus, although no evidence was adduced which proved their origin, but I have personally never seen such effects from vaccination, nor have I seen any disease that was certainly so produced." "I have had a few anomalous cases from using human ized virus, but even these only gave rise to a peculiar rash. which disappeared in a short time and left no permanent ill effects. I have never known a case in which specific disease was communicated." "I have seen only rashes, indefinite in character, but which always subsided with the exacerbations of the vaccinia. I once had a run of Scarlet Fever in a large family during and after vaccination, but I have always regarded it as co-incident only, and not at all as having had any connection with the operation." "The

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only ill effects that I have ever seen, were in two cases in which the parties procured their own virus which they insisted on using. The arms became so sore that I suspected which institute

Such were some of the opinions, based on personal experience, of the possibility of communicating other diseases by vaccination. As it was desirable if possible to obtain direct evidence of the occurrence of such communication special correspondence on this point was opened with several gentlemen whose replies to question 11 of the circular seemed to imply that they were in possession of such evidence, with the following results: "I have seen certain forms of skin disease follow vaccination, but I do not know that vaccination was the cause." "Years ago a number of persons were vaccinated with virus taken from the arm of a soldier who was home on furlough, and *it was said* that the sores resulting were Syphiloid in character. Certainly the scars which I saw were not typical." "I have seen one case, that of *a child vaccinated by its father with virus from the arm of a neighbor;* the neighbor, as was afterward learned was affected with Syphilis, and the child showed secondary symptoms." In these three cases the following things are to be noted: In the first that no connection was shown between vaccination and the skin disease which followed, nor is the assertion made that such connection existed; in the second, the gentleman who reports it, speaks of it only as hearsay, and only testifies from his own knowledge that the scars were not typical vaccine scars; in the third case the operation was performed by a non-professional man, and the source of the virus was subsequently found to be impure; there are other circumstances also, suggested by the account, which a physician would take into serious consideration before deciding, that the vaccination and the Syphilitic symptoms that followed stood in the relation to each other of cause and effect. "One

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family, the only instance of the kind I ever knew," says another correspondent, "had Scabies at the same time with vaccinia." Here nothing whatever is said to intimate that the two had any connection; anyone indeed, whether professional or non-professional, who knows the nature of Scabies and its existing cause, will find it hard to believe that vaccination can have aught to do with producing it.

But the strongest statement made in answer to question 11 was as follows: "YES, SIR; BAD! will furnish you with particulars hereafter." Here it was certainly thought that we had found a correspondent who believed that he had evidence of injurious results which would prove something, and the promised details were looked for with interest. After waiting for some time a note was addressed to the writer, who was khown to be a very busy man, asking that the history of cases alluded to might be forwarded; in reply a long communication was received, the substance of which is as follows: "A general vaccinating crusade was organized * * * * and during the weeks that followed there were many, very many sore arms, but as no humanized virus was used I always assured the friends that all would be well. *The cases were confined almost exclusively to those who took the least care of the person, who were poorly fed and living under the poorest possible conditions.** One family had a serious time, the tissues sloughing nearly from shoulder to elbow, and nearly if not quite half the circumference of the arm. All recovered in time.

"I am attending one child now who was vaccinated on the 6th, and on the 22nd was reported ill with Scarlatina. I saw him on the 30th and confess that for the first time I was alarmed for the safety of the child, knowing that *although it was the Scarlatinal poison at work, still the family and others would attribute it directly to the vaccination.*"*

*The italics are ours.

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Than this we have nothing stronger to offer, and the careful reader will see at once that in this there is no evidence of the communication of any disease, the worst being bad cases of ulceration in subjects of depraved constitution, living under the worst possible conditions in all respects — such subjects in fact as the surgeon or physician always dreads to encounter, and upon whom the results of any operation are doubtful, but that even these finally recovered without permanent injury. We feel fully justified in the assertion that in all the communications we have received *there is not a word of evidence that vaccination, when properly and carefully performed, is a source of danger of any kind.*

PERIOD DURING WHICH VACCINATION IS PROTECTIVE.

Upon this point we find a wide diversity of opinion; some hold that one thorough vaccination extends its beneficial influence over the whole remaining life of the individual; others that a few years serves to exhaust its powers, and between these two classes there are all conceivable variations, compatible with agreement on the main point that the protection conferred is absolute for a longer or shorter time. "I believe that it will protect fully for life in a large majority of cases and will modify the course of the disease in all," says one correspondent who has had a large experience in Small Pox cases. Another speaks thus: "I know that a single vaccination has protected me thus far, and I have been thoroughly exposed of late while examining cases." A third, with whom many others agree, thinks "That as a rule a single successful vaccination does give a perfect protection for life, but, as there are many exceptions, re-vaccination should be practiced as a matter of prudence." Another still, with whom also a number are in accordance, says that "a single successful vaccination in early childhood protects, I think, until adolescense; then I advise re-vaccination." Another class are of opinion that

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one successful vacination will always protect for life as against unmodified Small Pox, but does not give absolute security against Varioloid, and yet others think that there is no definite period over which vaccination can be said to be protective, but that, in this as in many other matters, each individual must be a law to himself. A large number consider it wise to re-vaccinate whenever Small Pox is prevalent, while others deem it sufficient if the condition of the system be tested about once in ten years, regardless of whether Small Pox be in the vicinity or not. Very few seem to think it necessary to practice re-vaccination as often as once in five years, the majority naming from seven to ten years as the minimum period within which a vaccinated individual may be considered safe.

With a single other point we close this account of the rise and progress of Small Pox in Wisconsin, during 1881 and 1882. By far the larger part of the gentlemen who have favored us with answers to our circular of inquiry reply that they prefer the use of bovine to that of humanized virus, giving generally as reasons for such preference the certainty of having a matter free from all taint, the greater energy of its action and the desire of their patients. A few use either humanized or bovine indiscriminately, and some prefer the use of humanized virus altogether, taking care to select healthy children vaccinated for the first time as its source. As we have already seen, there are very, very few who think there can be danger of communicating any disease other than the vaccine through the medium of the virus, and even those who have any fear of this, base their apprehension rather on theoretical than on practical grounds.

Dr. R. Martin, Health Commissioner of Milwaukee, than whom few, if any, physicians of our state have had wider opportunities for observing the advantages or disadvantages of vaccination says: "The freedom from Small Pox

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which we enjoy to-day is wholly due to the thorough vaccination done four years ago. We have not one case among our own resident population; can any other city where they have not been protected show as good results?"

[The following communication from Dr. J. G. Meachem of Racine, concerning Small Pox, is so interesting and instructive that we present it in full.—Sec'y.]

There have been twelve cases of Small Pox in Racine during the past year, and one case just outside of the city in the town of Mount Pleasant.

The disease was brought here in four instances direct from Chicago, and the other cases came from exposure to these. The first that occurred (September 28, 1881), were two cases in a German family who came here from Chicago; both were children, one about two years old, the other, I think, fourteen or fifteen; neither had been vaccinated, and one died. The remaining members of the family were all vaccinated, and all escaped the disease.

The next case in order of time was a lady of between twenty and thirty, who also came from Chicago. She had been vaccinated when a child, and in her case the disease ran a mild course. A man of twenty-five contracted it in a severe form from her; he had never been vaccinated. Another case originated from this in a lady of forty-five or more who had been vaccinated and consequently escaped with varioloid in the mildest form. Many exposures resulted from these three cases, but the individuals were all vaccinated and all escaped. The first of the three occurred in January not long after the 1st.

About January 23, a lady *came from Chicago completely broken out with Small Pox;* she was kept concealed for forty-eight hours at the house of her daughter and pretended that she did not know what ailed her. The daughter

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had a small child that had never been vaccinated, though she herself and her husband had been. At my first visit I vaccinated the child and revaccinated the husband and wife, but notwithstanding the operation was successful, they all three came down with mild varioloid.

The house in which the family lived was double, and the other half of it it was occupied by a family named M——, who were fortunately away from home when the Small Pox case came into the house, and they were forbidden to return until the disease should be over; they staid away for a few days, and then, becoming uneasy, M——, his wife and child paid a secret visit to the house and took thence some articles of clothing, etc., which they said that they were in much need of. No one suspected this visit until the father and child came down with Small Pox some little time afterward. Neither had been vaccinated, and both were confluent cases; the father died and the child recovered; the mother had been vaccinated in infancy and escaped.

While M—— was suffering under the primary fever he met a lady and her little daughter upon the sidewalk and conversed with them for some time; she remembered that he complained bitterly of headache, etc., and two weeks thereafter both she and the child came down with the unmodified form of the disorder. Neither had ever been successfully vaccinated; although many attempts had been made in the case of the mother, no effect had ever been produced; both recovered, and the husband and another child who had been vaccinated successfully previously, and were re-vaccinated at the time, escaped.

Yet another case was that of a workman at the plow factory, who continued at his work all through the first stages of the disease, and until the eruption was fully out without suspecting what the matter was until he received the information from a fellow-workman at his side. This man was boarding with his brother, who had a family of four

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children and a wife who expected to be confined in about a week from the time the disease declared itself. No persuasion would induce the family to allow the Small Pox patient to be sent to the pest-house; he had the disease in a severe form; I vaccinated the whole family immediately and the child immediately after its birth; the operation was entirely successful and all escaped an attack. It was a remarkable illustration of the protective power of vaccination against Small Pox, and the same power I think is also well shown in the other cases I have narrated.

On the day that the case was discovered at the plow factory every man connected with the establishment was vaccinated, and every one escaped an attack.

Still another case was that of a young lawyer from New York who had been making a collecting trip in the northern part of Wisconsin. He was re-vaccinated while in Milwaukee and while under the full influence of the operation came down with Varioloid. Had he not been re-vaccinated he would doubtless have suffered from the unmitigated disease.

All the cases I have reported as unvaccinated were genuine unmodified Small Pox; none that had been vaccinated suffered from anything worse than Varioloid, and the great majority escaped altogether.

DIPHTHERIA.

The number of cases of this disease which have occurred in the state during the year have notably decreased as compared with the preceding year which may be owing to one or both of two causes, both of which are mentioned by competent observers as being probably in action to produce this most desirable result: 1st, it is probable that we are entering upon a period of decline in the prevalence of the disease, the theory being that Diphtheria has its phases of increase

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and decrease running through a space of time more or less prolonged; that it has just passed through one of the phases of accession and entered upon that of decline which will last for an unknown period, possibly to be again succeeded by an increase in the extent and violence of the disease. 2d, that the people are learning to hold the disease in salutary fear, are also learning that its spread may be certainly checked by isolation of those who are unfortunately attacked by it, and by thorough and systematic disinfection of the sick room and everything used therein. Such measures have been persistently recommended by this Board, and their efficacy has been proven beyond all reasonable doubt in so many cases that it seems strange that they are not universally practiced. When their adoption becomes the rule in this or any other state, and when the public shall be so educated as to hold that exposure to the Diphtheritic contagion is as inexcusable as is exposure to the contagion of Small Pox, then we believe that outbreaks of Diphtheria will be as infrequent comparatively as are those of Small Pox, and that the occurrence of seven thousand cases of Diphtheria with sixteen hundred or more deaths in a single year will be a thing unheard of and impossible; that a tenth part of such mortality as has been reported for the past year will startle the whole state and lead to such close supervision of sanitary conditions, and the enforcement of such sanitary precautions, as would effectively control and prevent such frightful waste of life. The apathy of the people in reference to the contagious diseases which are commonly present among us, and which claim numerous victims among the children especially, in each year, is in striking contrast to the excitement and terror that prevailed during the presence of Small Pox which killed less than two hundred of our citizens, while Diphtheria which carried off upwards of fifteen hundred, is quietly accepted as inevitable, scarcely a show of resistance being made, the sick and the well in too many cases being

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allowed to mingle freely together in the home, the school and in all public assemblies.

The extent of this disease, and the terrible drain it has been upon child life, may be more fully appreciated by giving the aggregate number of cases which have been reported as occurring in Wisconsin during the past five years, which is no less than thirty-four thousand, eight hundred and ninety-four, of which number six thousand, nine hundred and sixty cases are reported as ending fatally, the probability, amounting to almost certainty, being that these numbers are considerably below the actual truth, since in no year have our returns been complete from the whole state, while in 1878 and 1879 not more that 70 per cent of the whole number of towns made *any* report.

The mortality from this disease during the year has been about 24 per cent as against about 23 per cent during the previous year.

Diphtheria has been most prevalent during the year in the following counties: Eau Claire, Polk, St. Croix, Chippewa, Rock, Portage, Winnebago, Monroe, Burnett, Outagamie, Dunn, Pepin, Door, Iowa, Sheboygan, Dodge, Columbia, Brown, La Fayette, Green Lake and Waupaca, the number of cases reported greatest being in the first named and decreasing in the others in the order in which they are mentioned.

SCARLET FEVER.

Much that has been said of Diphtheria and its prevention applies to Scarlet Fever also; it is so commonly regarded as one of the developmental diseases of the human race that the needless waste of life which it causes is too generally overlooked. Dane County reports the largest number of cases, although the mortality has been small; Eau Claire, Columbia, Clark, Rock and Brown Counties have been the most severely visited after Dane, in the order in which they are named.

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The death-rate for the state at large from Scarlet Fever during the year has been 13.9 per cent. of cases almost exactly the same as for the year preceding. Adams, Ashland, Bayfield, Burnett, Langlade, Marinette, Oconto, Price and Shawano counties have all apparently escaped the visitations of this disease entirely, no mention being made of its occurrence in any of the reports received from those localities.

TYPHOID FEVER.

This disease, which too often selects as its victims those who have arrived at the most vigorous period of life, is increasing over nearly the whole of the state, both in the number of cases and in the severity of its character. Seizing usually upon youths, young adults and those in the very prime of life, it causes a more serious drain upon the best resources of a community than any other of the diseases upon our list, and this fact gives it an importance which is not possessed by any disorder peculiar to childhood, or which attacks children in preference to older individuals.

The means by which Typhoid Fever is spread from person to person and through whole communities, has been ascertained with a close approach to certainty, and will be discussed hereafter. Unlike some other diseases of the zymotic class Typhoid Fever is not generally considered contagious; "great numbers of Typhoid patients are treated in our large hospitals and it is seldom that physicians, nurses or patients contract the disease from being brought into contact with it." It may very possibly therefore be the case that the appearance of a case of Typhoid in a neighborhood is considered as affecting only the patient, and that no particular precautions are deemed necessary for the protection of those living in the vicinity, using, it may be, water from the same well, and in other ways ignorantly exposing themselves to the danger of contracting the disease. This hypothesis will account for two significant facts discovered on consulting the registers of this Board, one of which is the tendency which

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the disease shows to remain in a town in which it has once made its appearance for several years in succession, and the other that in a large proportion of such instances the number of cases reported increases with each successive year. Thus out of 257 towns taken promiscuously, which have reported Typhoid as being more or less prevalent, 54 report its occurrence in a single year only, 121 report it in two successive years, 53 for three years in succession and 29 for four consecutive years or more. Again taking the reports sent to this office and studying them with regard to the recurrence of the disease in the same locality in successive years we frequently find such statements as are embodied in the following table:

FIRST YEAR.	SECOND YEAR.	THIRD YEAR.
2 cases.	5 cases.	
1 case.	5 cases.	
1 case.	4 cases.	
5 cases.	12 cases.	14 cases.
7 cases.	9 cases.	
2 cases.	10 cases.	11 cases.
2 cases.	5 cases.	9 cases.
8 cases.	12 cases.	20 cases.
7 cases.	24 cases.	37 cases.
2 cases.	10 cases.	14 cases.
4 cases.	7 cases.	9 cases.
4 cases.	13 cases.	8 cases.
3 cases.	12 cases.	28 cases.
6 cases.	10 cases.	6 cases.
4 cases.	6 cases.	10 cases.
4 cases.	5 cases.	5 cases.
6 cases.	8 cases	32 cases.
6 cases.	8 cases.	10 cases.
4 cases.	12 cases.	7 cases.
6 cases.	8 cases.	5 cases.
12 cases.	6 cases.	8 cases.
4 cases.	10 cases.	8 cases.

In all of these cases the general tendency toward increase, or at best a slow decline is observable.

The disease has been most extensively prevalent in Sheboygan, Calumet, Washington, St. Croix, Juneau, Monroe,

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Jefferson, Pierce, Sauk, Winnebago, Manitowoc, Dane, Racine, Fond du Lac and Brown counties in the order in which they are named. But very few counties in the state have escaped its attacks in some degree; the only ones making no report of its occurrence are Langlade, Pepin and Price counties. The rate of mortality seems to have been greatest in Fond du Lac county; Manitowoc county is second in order, and Jefferson ranks third. The average mortality for the whole state has been very nearly twenty per cent. of cases, a decided increase over that of the preceding year.

The researches of Dr. Budd and others have rendered it exceedingly probable that Typhoid Fever has its origin in accumulations of filth, animal and vegetable, around human habitations, and "it has been proven beyond a doubt that water used for drinking and culinary purposes is often the medium through which the Typhoid poison enters the human system." There are many considerations also which render it certain that the excreta of persons suffering under the disease have contaminated the water of wells and other sources of supply with disastrous effects. Not to go beyond the records of our own state, cases of this kind have occurred under the notice of competent observers far too often to leave any doubt on the matter. Drs. Guernsey, of Almond; Catlin, of Geneva; Murdock, of New Richmond; Meller, of Retreat; Wenzel, formerly of Theresa, now of Milwaukee; Jenkins, of Kilbourn City; Miller, of Ontario; Smith, of Wonewoc; Monteith, of Colfax; Barnett, of Neenah; Allen, of Oconto; Davis, of River Falls, with others among our own correspondents have put on record observations of this kind, and Dr. Schweichler, of Manitowoc, has given a valuable account (published in a former report of this Board) of an outbreak largely due to the use of water so contaminated. So many different cases in parts of the state so remote from each other, the steady increase in the number of cases from year to year, the per-

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sistence of the disease in the same place year after year, and the general rule, to which attention has been called on a preceding page, of the gradual augmentation, the tendency to remain at a fixed rate, or, at best, the slow decline of Typhoid Fever in a place where it has once obtained a foothold, are all significant features in studying this disorder and its progress, and all tend to the conclusion that some insiduous agency is at work in the matter.

A fact worthy of particular notice in connection with the occurrence of Typhoid during the year in Wisconsin, is that the large number of cases recorded *is the aggregate of quite small numbers* reported from many places. The largest number reported from any single place is only about one and one-half per cent. of its whole number of inhabitants as given in the United States census of 1880.

In former reports of this board many instances have been recorded, as has already been said, in which accompanying circumstances were such as to lead the attending physicians to believe that the drinking of impure water had produced the disease. In the history given by Dr. Schweichler the spread of the malady was such as to render it exceedingly probable that the excreta of the first patient found a way into the well at the boarding house where he was, the water from which being used by several families carried Typhoid to them. Dr. Miller says: "A family of five contracted fever from the use of water drawn from a cistern; the fever took on a Typhoid character and was intractable until the use of the water was discontinued." Says Dr. Catlin: "Five cases of Typhoid Fever were clearly traceable to bad well water; one proved fatal." Says Dr. Barnett: "In a single family I had charge of six cases of Typhoid affording almost unmistakable evidence of filth origin; the well and privy were only eight yards apart, and the soil was a sandy loam upon a clay sub-stratum. No other case of the disease existed in the neighborhood, but the distinctive clinical

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phenomena were all present, and all unmistakable." Other quotations might be made at great length, but these are sufficient.

Let us consider the general condition of the soil in almost any of our cities and towns in the more densely populated parts of the state, and having done so let us ask the question, what kind of water is probably to be drawn from wells sunk in such soil?

Taking twenty of the more important towns and cities in the oldest portions of the state, having populations of from two to ten thousand, the areas which they cover will be found to vary from 750 acres to 5,000 acres, the more densely populated occupying in several instances less ground than places of smaller population. Thus one town having a population of about 8,000 contains 960 acres within its corporate limits, while another place with a population of 5,000 covers an area of 3,200 acres. Consider now any one town which has been settled and growing for thirty or forty years, and which has attained only a medium population, say 3,000, in that time.

Physiologists tells us that each individual discharges every twenty-four hours through the bowels and urinary organs about fifty-six ounces of excrementitious matter, and that other portions are removed from the skin by washing, and in other ways. Regarding only the portions first spoken of, we have a total annual amount of one hundred and thirty-six pounds of solid excreted matter, and eleven hundred and forty pounds of liquid excretion for each individual, and, in a population such as that assumed above, a quantity equal to ten thousand five hundred pounds is daily deposited in or upon the soil, or nearly two thousand tons every year. It is unnecessary to carry this calculation any further; every one can furnish any additional details for himself.

Yet there are very few places in the state where any

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thought whatever is given to the removal or disposition in any way of such matters after they have once been deposited in the privy vault or upon the surface of the ground. Add now to the matters above spoken of those produced by the many animals kept in a town of 3000 people, the household refuse produced in many ways, all of which finds its way to the soil by one or another road, and all of which decays, and increase the whole by the organic *debris* from manufactories of various kind, and it will be evident that a soil upon which such huge amounts of noxious material are deposited everyyear cannot fail to contaminate the water which percolates through it, and that water drawn from wells dug in such soil cannot in time fail to become other than foul and unwholesome.

Here then we have a cause at work all over the state, increasing year by year in power, insidious and apt to be overlooked, yet capable of producing all the effect of which we have spoken. It is not asserted that to this and to this alone is due the continued existence or the steady increase of Typhoid Fever. There is no positive evidence that such is the case; but evidence enough, wholly incontrovertible does exist that Typhoid Fever has been again and again produced by the use of polluted water, that dangerous, even deadly pollution may be present in water which to all appearance is pure, and no one it would seem can study the facts without admitting that there is serious reason for apprehension. It is earnestly hoped that the people of Wisconsin will heed these facts and by timely measures prevent unnecessary fouling of the soil, and thus preserve the purity of their water supply. In this way a long step may be taken toward the preservation of health and an experiment be tried which will go far toward answering the questions suggested by the increased prevalence of Typhoid Fever in Wisconsin.

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MEASLES

Has been more widely prevalent in all parts of the state than any other disease, although as a rule it has not been of a very severe type, the mortality averaging only one and seven-tenths per cent. of cases. Two striking exceptions to this average, however, are noticed in Dane and Brown counties in which the mortality is reported at six and seven-tenths per cent., and four and one-half per cent. respectively, death rates so large as to engender a suspicion that there must be some error in the reports. Dane, Rock, Richland, Portage, Waupaca, Sauk, Jefferson, Brown, Adams, Milwaukee, Outagamie, Columbia, Calumet, Walworth and Wood counties, in the order named, have been the chief sufferers from the disorder; the death rate in any of these, with the ex-exceptions named, has not risen above two per cent.

Door and Marinette counties are the only ones from which no cases of Measles are reported; Lincoln, Pepin, Eau Claire, Price and Kewaunee counties report very few cases, the numbers ranging from one to ten only. Buffalo, Burnett, Chippewa, Clark, Door, Douglas, Eau Claire, Green Lake, Jackson, Kenosha, Kewaunee, Monroe, Oconto, Ozaukee, Pepin, Price, Sheboygan, Trempealeau, Waushara and Winnebago counties all seem to have been visited by a very mild type of the disease, no deaths being reported from any of them, although the number of cases in some is given at nearly three hundred.

WHOOPING COUGH.

This disorder has also been somewhat more widely prevalent during the past year than in the year covered by our last report, though the number of cases has not been greatly above the average of the last four years: the increase indeed is not greater than was to be expected with the increasing population of our state. The districts most severely visited have been Sauk, Winne-

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bago, Outagamie, Dunn, Portage and Brown counties. The death rate has been highest in Brown county, where it is reported at 9 per cent., and Dunn county, in which it has reached 4 per cent. In the state at large the mortality from Whooping Cough has been one and three-tenths per cent. of cases, thus showing the type of the disease to have been much milder than in the preceding year.

For purposes of comparison we give here in tabular form the percentage of mortality from the six diseases which form the special subjects of inquiry in our state during the last five years:

FOR THE YEAR ENDING MAY 31.	1878.	1879.	1880.	1881.	1882.	AVERAGE.
Small Pox	16.6*	42.74†	22.2‡	5.88‖	17.§	20.88
Diphtheria	18.59	14.54	20.06	22.66	23.6	19.89
Scarlet Fever	12.	11.94	12.09	13.89	13.9	12.76
Typhoid Fever	15.66	19.16	20.63	16.14	19.9	18.29
Measles	0.92	1.38	1.52	1.33	1.7	1.37
Whooping Cough	1.17	2.4	1.69	2.5	1.3	1.81

*The whole number of cases reported in this year was 421, with 70 deaths.

†62 cases and 27 deaths were returned during this year.

‡There were but 9 cases in all reported in 1881, two of which proved fatal.

‖The record for this year shows 17 cases, with one death.

§These figures represent the present year; vide table.

OTHER DISEASES.

Pneumonia and other accute affections of the respiratory organs have been reported as prevailing to an unusual extent in eighty-five towns; chronic pulmonary diseases are recorded in seventy-three different localities; both acute and chronic disorders of this class are reported from places situated in all parts of the state.

MALARIAL DISEASES,

are reported from fifty-two places situated for the most part on a line starting from Buffalo county, extending thence southwardly through Trempeleau, La Crosse, Vernon, Rich-

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land, Crawford, and Grant counties, running thence through Iowa, Green, and others of the southern tier of counties to Racine county whence it returns, taking Jefferson, Columbia, Green Lake, Marquette, Juneau and Monroe counties in its course. Another smaller district, where Malarial disorders are said to have been prevalent to a limited extent, is formed by parts of Door, Shawano and Marinette counties. Diseases of this character are much less frequently reported in all parts of the territory in which they occur than for the preceding year.

DIARRHOEA, DYSENTERY, ETC.,

including Cholera Infantum, are reported as occurring in widely scattered localities in Buffalo, Calumet, Clark, Dodge, Eau Claire, Grant, Marathon, Portage, Rock, Waupaca, and other counties. From the small number of localities making report of these diseases, and the extent of the area over which they are distributed, it is inferred that there was but little sickness of this kind anywhere in the state during the year.

MUMPS,

which attracted considerable attention in the preceding year by the severity with which it attacked many individuals, and the serious character of its sequelae in some instances, has been this year of very little importance in any respect. It has lingered in Adams, Barron, Clark, Pierce, Portage, Waupaca and Winnebago counties, whence its occurrence was reported last year, and has probably traveled into La Fayette, Marathon, Outagamie, Rock, Shawano and Washington counties from contiguous counties in which it was prevalent a year ago; nowhere, however, does it appear to have been very widely spread.

CEREBRO SPINAL MENINGITIS.

This formidable malady is reported as having occurred to some extent in Barron, Columbia, Crawford, Grant, Green,

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Green Lake, Juneau, Marathon, Pierce, Polk and Wood counties; in several of which it was reported as occurring during the preceding year. It has been most severe in Crawford county, from one town in which twelve cases with seven deaths are reported. In the other counties it has been much milder in type and the cases have been few and scattered.

These are chief diseases which have appeared anywhere in Wisconsin within the year in amount sufficient to attract attention, and the exhibit is, upon the whole, a satisfactory one. But it is frequently remarked by the officers and others to whom we are indebted for much of our information, that the general good health of the state is owing rather to natural advantages of soil, climate, etc., than to any general obedience to the laws of health, or any attention paid by our citizens to keeping their dwellings and surroundings in good sanitary condition.

It is greatly to be feared that this remark is true, and that conditions now existing are such as to render an increase in the number and severity of character of certain disorders tolerably certain in the near future.

SANITARY WORK.

Of what may be called individual sanitary work the prospect is encouraging; many reports speak of the general cleansing that towns and villages have undergone, not through any action of the municipal authorities, though they have not been idle, but by means of the work done by individual residents upon and around their own premises. For example, it is reported from more than three hundred towns that greater care is taken in the drainage of cellars. From about an equal number the report is made that more attention is paid to the proper location of privies in the first instance, and to their more freqent cleansing and disinfection thereafter, while in about a hundred and fifty localities

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earth closets have superceded the foul and disgusting vault to a greater or less extent.

Such work as this gives the best possible foundation for public sanitation in any community, large or small. When once the people begin to set their own homes in good sanitary order, it will not be long before they will demand that the same thing shall be done for the town or village in which they reside, and when once such demand is made in earnest the authorities must comply therewith. Such works as well-considered plans of drainage and sewerage and public improvements of like character, are much more apt to be carried out in a community where the houses are carefully regulated in a sanitary point of view, than elsewhere, and the questions asked in the blank forms for reports issued anuually by this Board are doing their part in calling attention to many things which, but for them, would receive little or no attention.

HEALTH OFFICERS.

The number of these valuable officials has been very little increased during the past year. In more than one town where Small Pox made its appearance it spread solely because there was no one authorized to take the prompt and efficient measures that the emergency demanded; the physician who was called in could only advise that his patient should be isolated, and notify some member of the town board of the prevalence of the hateful disease; then, at his leisure, the official notified might consult with the town clerk, and the two together would call a meeting of the board on notice to all the members. All proper formalities being complied with the board might assemble and vote that a watchman should be employed and that the dwelling of the patient should be quarantined. Meanwhile sympathetic neighbors might have been — were in many cases — running in and out, discussing the question of whether the doctor

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really knew what he was talking about, whether it actually were Small Pox or only "Black Measles," whether vaccination really does any good or not, and laying tracks on which the malady should soon enter their own homes; another portion were sending to the president and secretary of this board telegraphic dispatches urging that all sorts of things should be done, the power to do which rests wholly with the local authorities. Had every town appointed a capable man — a physician if practicable — as health officer, giving him power to act in case of need, subject to the subsequent approval of the board, if such course be thought proper, but authorizing him at once to act, to isolate a case of Small Pox or other contagious disease, and, if he were not himself a medical man, directing him to see that the rules prescribed by the attendant physician in regard to communication of the patient and his attendants with friends and visitors were strictly carried out, and providing that all this shall be done promptly and without waiting for meetings to be called, and for the special authorization of the local board in each particular case; had this been done in all the towns of the state in preparation for the emergency which came to many, a large proportion of the cases of Small Pox that have occurred during the year would never have been recorded, because a large majority of the initial cases would have been promptly isolated before any serious exposure had taken place.

It is true that, in not a few cases, physicians took the responsibility of enforcing their own directions, and that they were in such instances sustained by the authorities, but no man likes to feel that he is acting at considerable personal risk even when what he does is done for the safety of the community; and no community has the right to ask that such risks shall be taken when it has the power to take all needful steps for its own protection, which power it neglects to exercise.

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Secretary's Report.

This Board, feeling the necessity that exists at all times for the appointment of an efficient health officer in every town, a necessity that was terribly evident on a number of occasions during the winter of '81-82, caused a carefully drawn bill to be prepared requiring the organization of a health board and the appointment of a health officer, in each town of the state, where they were not already provided for. The question of compensation was left entirely to each local municipal authority, as it was felt that each town organization could judge best of the value of the service which might be rendered. The bill failed to receive the approval of the legislature however, having been indefinitely postponed in the senate after passing the assembly. The following is the text of the bill as prepared by this Board and presented to the legislature:

A BILL for the better preservation of the Public Health.

The People of the State of Wisconsin, represented in Senate and Assembly, do enact as follows:

Section 1. Every town board, village board, or common council of every town, village or city in this state shall hereafter, within thirty days after each annual election, organize themselves into a Board of Health, or shall appoint from their own members or otherwise, a suitable number of competent persons, who shall organize by the election of a chairman and clerk, and exercise all the powers and perform all the duties of a Board of Health in and for such town, village or city: provided, that no special health department shall have been established or constituted by the charter or other act of incorporation of any such town, village or city. And every board of health organized, appointed or elected under the provisions of this act, or of any general or special act heretofore enacted, which does not specifically provide for and direct the appointment of a health officer, shall, within ten days after its organization as herein provided, appoint a competent and proper person, who shall be, whenever the same is practicable, a reputable physician, who shall be the health physician and health officer of the town, village or city; and who shall hold office during the pleasure of the board by whom he shall be appointed, and until his successor shall have been duly appointed and qualified; and in case of the occurrence of a vacancy, by reason of the death, resignation, removal or refusal to serve of any such health officer, the board of health shall, within ten days thereafter, proceed

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to fill such vacancy, by making a new appointment as herein provided; and immediately upon the appointment of any health officer under the provisions of this act, the board of health making the same shall transmit to the office of the State Board of Health the name and post office address of the health officer so appointed. And all health officers appointed under the provisions of this act shall be *ex-officio* members and executive officers of the boards by whom they are appointed.

Section 2. It shall be the duty of every health officer appointed under the provisions of this act, upon the appearance of Small Pox, Diphtheria, Scarlet Fever or other contagious, infectious or pestilential disease in the town, village or city under his supervision, immediately to investigate all the circumstances attendant upon the appearance of such disease, and to make full report thereof to the board of which he is the executive officer, and to the State Board of Health, and promptly to take such measures for the prevention, control and suppression of any contagious, infectious or pestilential disease as may in his best judgment be needful and proper, subject to the approval of the board of which he is a member; and it shall be the duty of every health officer to keep and to transmit to his successor in office a record of all his official acts. And the salary or other compensation to be paid to every health officer appointed under the provisions of this act shall be established by the board of health by whom such officer shall be appointed.

Section 3. Whenever any householder, or the head of any family shall know of, or have reason to suspect the existence of Small Pox, Diphtheria, Scarlet Fever, or any other contagious disease in his house or family, he shall immediately give notice thereof to the health officer or to some member of the board of health of the town, village or city of which he is a resident, and any householder or head of a family who refuses or neglects to give such notice for forty-eight hours after he shall know of, or suspect the existence of any such contagious disease in his family or household, shall, on conviction thereof, be liable to a penalty not exceeding the sum of fifty dollars for each day of such refusal or neglect after the expiration of said term of forty-eight hours; and whenever any physician shall know that any person whom he shall be called upon to visit is sick with Small Pox, Scarlet Fever, Diphtheria or other contagious, infectious or pestilential disease, it shall be his duty immediately to give notice thereof to the health officer or to the board of health of the town, village or city wherein the person so affected shall be at the time; and any physician who shall refuse or neglect to give such notice within forty eight hours after he shall know of the existence of any case of any of the aforesaid diseases, in the person of any one whom he may be called upon to visit, shall, upon conviction thereof, be liable to a penalty of not less than twenty-five dollars, nor more than one hundred dollars for each day of such refusal or neglect, after the expiration

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of the said term of forty-eight hours; and every householder, head of a family or physician who shall knowingly and wilfully conceal the existence of any case of Small Pox or other contagious or pestilental disease, or who shall willfully assist or connive at such concealment, shall, upon conviction thereof, be liable to a penalty of not less than fifty dollars or more than three hundred dollars for each day of such willful concealment, or to imprisonment in the county jail for a term of not less than one month and not longer than six months.

Section 4. The district board of any school district, or the board of education of any city, or the faculty or governing board of any college, university, normal school, academy or other institution of learning, shall have power to exclude from the school, college or other institution of learning under their charge, and it shall be their duty to exclude therefrom, whenever advised to do so by the board of health of the town, village or city in which such school or other institution of learning is situated, any child or student, who, by reason of being affected by any contagious disease, or of living in any family, household or dwelling where any such disease exists may be a source of danger to the health of others; and such exclusion shall continue untill the health officer or some reputable physician shall, in writing certify, that to the best of his belief, such child or student may be readmitted to school without danger of communicating disease to others.

Section 5. The district board of any school district, board of education in any city, faculty or governing board of any college, university, normal school, academy or other similar institution, shall have power to exclude from attendance at any school, college or other institution under their charge, any child or student who has not been properly vaccinated, or who does not present a certificate signed by some reputable physician, to the effect that such child or student has been properly vaccinated or revaccinated, as the case may be, within five years immediately preceding; and it shall be the duty of any such board or faculty to exclude any such unvaccinated children or students from attendance, whenever the board of health of the town, village or city wherein the school, college or other institution may be situated, shall certify that such exclusion is necessary or desirable as a means of safety to the public health, by reason of the existence of Small Pox in or near such town, village or city, or in any place wherewith the same may be in frequent communication; but such exclusion shall continue only until the presentation of a certificate of proper vaccination, signed as herein above provided. And all district boards and boards of education may, at their discretion, require any teacher in their employment to present a certificate signed by some reputable physician to the effect that such teacher has been properly vaccinated or revaccinated, as the case may be, within five years immediately preceding, and such boards may, after ten days' notice of their intention so to do, suspend faom teach-

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ing in any school under their charge, any teacher who shall neglect or refuse to obtain such certificate of vaccination or revaccination until the same shall have been obtained and presented; and no teacher suspended under the provisions of this section shall have any claim for wages or salary during the time of such suspension. And the board of health in any town, village or city shall have the power to offer vaccination or revaccination at the cost and expense of the town, village or city, to all persons resident therein, and to appoint any competent physician or physicians to vaccinate or revaccinate all who may apply to them for that purpose, who, in the judgment of such board, are unable to pay for such vaccination.

Section 6. From and after the commencement of the school term next following after this act shall take effect, every child or other person who shall for the first time apply for enrollment or admission as a pupil or student in the public schools of any village or city of this state, shall, at the time of making such application, present to the teacher of such school a certificate signed by the health officer of the village or city in which such school is situated, or by some reputable physician, to the effect that the child or person so applying for admission presents evidence of having been properly vaccinated, or that in the opinion of the said health officer or physician vaccination of such child or other person is unnecessary, or would be injurious; and the enrollment lists of all public schools in cities and villages of this state shall show by whom such certificates was signed; and any child or other person who shall fail to present a certificate in the manner and to the effect provided for by this section, shall be excluded from admission or enrollment as a pupil in the public schools of any village or city in this state, until such time as he or she shall obtain and present such certificate as herein provided.

Section 7. The state board of health shall prescribe suitable forms in which all certificates and notices required by this act may be given.

Section 8. All expenses incurred in carrying out the provisions of this act or any of them shall be paid by the town, village or city by which, or on behalf of which such expenses shall have been incurred.

Section 9. Upon complaint made in writing, under oath, before any magistrate or justice of the peace charging the commission of an offense against the provisions of this act in his county, it shall be the duty of the district attorney to prosecute the offender, and all sums recovered under the provisions of this act shall be paid into the treasury of the town, village or city wherein the offense shall have been committed for the benefit of the general fund thereof.

Section 10. This act shall take effect and be in force from and after the date of its passage and publication, and all acts and parts of acts conflicting with the provisions of this act in so far as they contravene the same are hereby repealed.

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It is worthy of note that such provisions as are embodied in the above act for the appointment of health boards and health officers, with clauses requiring the report of contagious disease, are very commonly to be found in city charters, and that this bill only proposed to make general what is found desirable in many localities. The correspondence of this office makes me confident that had the above bill, or one equivalent thereto been in force when Small Pox first made its appearance, the benefits would have been great, inasmuch as the more prompt control of the disease would have been insured in several places where it prevailed and the early discovery, and proper management of concealed cases would have been rendered almost certain. Such a law also by its requirement that all cases of dangerous contagious disease be promptly reported, would render valuable service in the prevention and control of all disorders of that class.

CONTAGIOUS DISEASES, AND THE PUBLIC SCHOOLS.

It will be observed that sections 4, 5 and 6 of the bill printed in foregoing pages, relate almost exclusively to the public schools and other educational institutions in the state; these sections were intended to supply what seems to be a defect in the laws of the state, and one which possibly may make serious difficulty for school authorities in the future. Indeed such difficulty seemed very likely to occur in one of the larger cities in the western part of Wisconsin, during the prevalence of Small Pox therein in December and January last, and was the subject of considerable correspondence with this office.

There is at present no statute under which a child or other person coming from a dwelling in which contagious disease of any kind is known to exist can be excluded from attendance at the public school. It is probable that local boards of health acting in conjunction with school authorities could exclude from the public schools children coming from

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houses in which contagious disease exists, or that the board of health of any town might do so upon its own motion, but what is needed is some provision which shall give specific authority to school boards acting through the teachers to do the same thing whenever the necessity therefor may exist.

There is little doubt that should the question ever come before the courts of Wisconsin, their decision would be in favor of the right of the school authorities to exclude; the decision has already been made in other states that the right to attend the common schools is not an exclusive personal right, but must "like other common rights, that of way for example, be exercised under such limitations and restrictions that it shall not interfere with the equal and co-extensive rights of others. *Take the case of a contagious disease; can it be doubted that the presence of a pupil infected could be lawfully prohibited* [from attending school], not for any fault, or crime, or wrong conduct, but simply because his attempt to insist on his right to attend under such circumstances would be dangerous and noxious, and so an interruption to the equal and common right?"* It will be observed that the court in the above quoted decision uses the case of a child personally affected as an unquestionable illustration of a case in which attendance on school may be prevented, and there is little room for question that, in the absence of any express statutory provision, the courts of this or any other state would decide in favor of the district board excluding a pupil under such circumstances. The danger is equally great, however, and the invasion of the common right no less in the case of a child who, though not himself actually affected, yet comes from a dwelling in which contagious disease exists, it may be directly from the room in which a brother or sister lies suffering under Diphtheria, Scarlet Fever or Measles, and having his clothing and person fully charged with the subtle germs of such

*Supreme court of Massachusetts, quoted in Wisconsin School Laws.

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a malady, to be freely distributed among his schoolmates. Such instances have occurred repeatedly, and the mysterious appearance of these diseases in different towns might have been accounted for in some such way, had careful inquiry concerning it been made.

Instance after instance has been recorded in our own reports in which contagious disease has started from the school house as a focal point, spreading thence all over the town, or village, or district, carrying death into many homes, visiting others with expenses hard to be borne, perhaps with actual privation, and bringing in all cases anxiety and distress. "The public school was the focal point of an outbreak of Diphtheria."—"Measles affected one school district, the origin of which was clearly traced to one boy who had communicated the disorder to others."—"Some children who attended school scattered Measles through every household where there was any one liable to attack."—"Whooping Cough was spread over the town by the agency of the public school."—"The children of a certain family contracted Diphtheria, carried it to school and communicated it to their class-mates, and then it spread throughout the town." Such are a few of very many illustrations of the necessity for some regulation such as that under discussion.

REGISTRATION.

A law has for some years stood upon our Statute Books which requires physicians to report all cases of Births and Deaths occurring in their practice. This law has been conscientiously and carefully obeyed by some; by others it has been obeyed when convenient, and by others still it has been systematically disregarded on the plea that its requirements are unjust, if not unconstitutional, because it requires service without compensation. Such a plea has no foundation inasmuch as the state grants to the medical profession certain

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privileges and exemptions which constitute an ample return for any service required or trouble involved by the registration law.

But even though no such privileges were granted it is still the duty of the physician to obey the laws and to give due and timely information of all births and deaths occurring in his practice, because, in the first place, the state has an undoubted right in the exercise of its supreme power in the interest of the whole people to require such information, and, in the second place, the only ground on which the claim that "such a requirement is unconstitutional" can be based, is, that such knowledge is property and that no man can be deprived of his property except by due process of law, or that the time and labor demanded are the equivalents of property. The last mentioned objection is disposed of by the mere mention of the fact that the state under various conditions demands the time and labor of its citizens, holding that the advantages of protection, &c., constitute an ample return. Concerning the first "There is no law," says Dr. O. W. Wright, (formerly Health Commissioner of the city of Milwaukee, and an educated lawyer as well as a physician) in discussing this subject, "that transforms into property the knowledge * * * * * * which the physician incidentally acquires in the practice of his profession. The knowledge which a citizen fortuitously acquires of any fact material to the issue of a cause in litigation, is not his private property on which he may set a price and refuse to part with it except on his own terms. The State orders him peremptorily into court and requires him to part with his knowledge under oath * * * Any person who happens to know of the existence of a felony, is required by the state to inform the proper authorities under penalty of being treated as a criminal himself. There are many things which the governing agency refuses to stamp with law as property.

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"The obligations of physicians to furnish the public health authorities with death certificates, and reports of contagious diseases in their practice, not only pertain to this higher plane of legal duties, which is above and beyond mere property considerations as viewed in the amendments of the Federal Constitutions, and in provisions of the constitutions of various states, but may be construed as in the nature of a license. The state, in the exercise of its police power, may impose any reasonable condition on the practice of medicine. It may require an annual license fee or it may allow any man to practice physic or surgery only upon the condition that the practitioner shall furnish the public with certificates of death and information of the existence of infectious diseases. 'It is universally understood to be one of the implied and necessary conditions upon which men enter into society and form governments that sacrifices must sometimes be required of individuals for the general benefit of the community, for which they have no rightful claim to specific compensation.*'

"As then there cannot possibly be any property, any vested interest in a mere potentiality of service, only in service actually performed, and as the state and its municipalities cannot be required, like private corporations, to precede or accompany the demand for service with payment, it follows that the proper remedy is, not refusal to comply with the demand, but to present a claim for compensation and to enforce the same through the agency of the courts. The same court that will inflict a penalty for disobedience to the law may adjudge that the party convicted and fined would have been entitled to compensation if the required service had been rendered.

"Such services are usually rendered within municipalities which have ample authority to consider claims, to allow and

* From the opinion of the court in the case of Bradley vs. the N. Y. & New Haven R. R. Co.

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order payment of the same; which are amenable to the processes of the courts and are liable like individuals for services ordered and received. It cannot be said, therefore, that the state has made no provision for payment of a just compensation when such services shall be ajudged to be invested with a property right.

"If then medical men in any particular locality wish to test the validity of statutes and ordinances requiring them to make death certificates and report cases of infectious disease, my sincere and earnest advice to them is that they proceed by a courteous demand for compensation and not by a defiant refusal to obey law. They will thus secure the sympathy if not the co-operation of the health authorities; the public, for whose benefit and protection the state uses its almost unlimited police power, will in that case be much more inclined to treat their claim with consideration and respect."

The legislature of this state at its last session, however, took a step which effectually does away with the claim above spoken of, that the state in requiring physicians to make registration, demands of them service without compensation, and it is earnestly to be hoped that this step will be followed up by others which will end in giving us, in the course of no very long time, a registration system under which the dates of all births, marriages and deaths with all the necessary circumstances attendant upon these events will be duly and promptly recorded.

The following is the text of the statute to which reference has been made:

The people of the State of Wisconsin, represented in Senate and Assembly, do enact as follows:

Section 1. Every physician, surgeon, or other professional person who shall comply with the provisions of sections 1023 and 1024 of the revised statutes, shall receive for each certificate returned to the register of deeds, and certified to as provided in said sections, the sum of fifteen cents, to be

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audited and paid out of the county treasury, on an itemized account, verified by his oath.

Section 2. This act shall take effect and be in force from and after its passage and publication.

Published April 12, 1882.

The sections of the Revised Statutes to which reference is made in the above act are as follows;

Section 1023. Every physician or other professional person under whose care a birth shall take place, shall at once make a record thereof in a book therefor, which shall contain, so far as can be ascertained, the full name of the child, if any have been conferred, its sex, color, names of any other child or children of the same parents living, full name and occupation of the father, full name of mother previous to marriage, the day, hour and place in and at which such birth occurred, and shall within thirty days after such birth return the same facts in the form of a certificate duly dated and signed by him, to the register of deeds of the county in which such birth shall have taken place. In case any birth shall occur without the care of a physician or other professional person, and no physician or other such person shall be in attendance professionally upon the mother immediately thereafter, the parent or parents of such child shall certify and make return of such birth to the register in the manner and form and within the period above required.

Section 1024. Every physician or surgeon who shall be in attendance professionally at the time of the death of any person shall at once make record of such death in a book therefor; which record shall, so far as can be ascertained, contain the full name, sex, color, age, occupation, place of birth, names of parents, time and place of death, and the disease or cause of death, and if within his knowledge the name of the burial ground in which interred, and if married at the time of such death, the name of the husband or wife; and shall within thirty days after such death return the same facts in the form of a certificate, duly dated and signed by him to the register of deeds of the conuty in which such death shall have occurred.

OUR CORRESPONDENTS.

The number of gentlemen to whom we are indebted for information has been larger this year than ever before. To those who constituted our special *corps*, and to local health officers in many parts of the state, we owe much of the knowledge embodied in this report concerning disease and

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the sanitary conditions prevailing in various localities, and from their communications chiefly has been drawn the material that has enabled us to trace so accurately the course and extent of Small Pox in Wisconsin during the year. Many of them are personally unknown to us, but with scarcely an exception they have returned the fullest and most courteous answers to our circulars of inquiry and have sought to give us all practical information upon matters connected with public health and sanitary affairs. We return once more our sincere thanks for their hearty co-operation in our work, and their sympathy with our efforts to extend a knowledge of sound sanitary principles among the people, and invoke their aid in the work yet to be done. We again cordially invite all who are interested in our work to communicate with us, to give us any facts that may be within their knowledge in regard to the public health, or to make any suggestions in relation thereto.

There are yet many parts of the state with which we desire to put ourselves in connection, and where the presence of known co-laborers would be gratifying and helpful.

THE LIBRARY OF THE BOARD

is constantly increasing in the number of its volumes chiefly by the way of exchanges with other Boards, gifts of works on sanitary and kindred subjects, presented by their authors, and volumes published by state authority. While some of these contributions have only a local or temporary value, there are many others in which are to be found original contributions to sanitary science of much worth and which are highly prized. The acquisitions for the past year are as follows:

Gifts. Report on Diptheria, by Franklin Staples, M. D., from the author; Water Supply and its relations to Health and Disease, by W. H. Dickinson, M. D., from the author; Reports from United States Consuls on the Commerce and

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Manufactures of their districts, November 7 and 14, 1881, from the Department of State, Washington, D. C.; Fifth Annual Report of the State Board of Health of New Jersey, from E. M. Hunt, M. D., Secretary; First Annual Report of the National Board of Health, from. T. J. Turner, M. D., Secretary; Third Annual Report of the State Board of Health, of Illinois, with Official Register of Physicians and Midwives, from J. H. Ranch, M. D., Secretary; Taste and Odors of Surface Waters, by Prof. W. R. Nichols, from the Transactions of the Boston Society of Civil Engineers, from the author; Annual Report of the Health Officer of the City of Burlington, Vt., from H. H. Atwater, M. D. H. O.; Eighth Annual Report of the Secretary of the Board of Health, of Knoxville Tennessee, from S. B. Boyd, Secretary; Historic Sketch of the Origin and Progress of International Hygiene, by J. L. Cabell, M. D., from the author; Bulletins of the Essex Institute, Mass.; Personal Sanity Responsibilities by J. K. Allen, Esq., from the author; Small Pox Hospitals, from the State Board of Health of Iowa; The Aim and Work of the Social Purity Alliance, by J. K. Allen, Esq., from the author; How to Combat Small Pox, by O. W. Wright, M. D., from the author; One Hundred and Eleventh Annual Report of the New York Hospital and Bloomingdale Asylum; First Biennial Report of the State Board of Health, of Iowa from R. J. Farquharson, M. D., Sec.; Fourth Annual Report of the Board of Health of the city of Augusta, Ga.,from the board; Annual Report of the Board of Health of the city of Reading, Penn., from the board; Reports from U. S. Consuls on the Commerce and Manufactures of their Districts, November 16, 1882, from the Department of State Washington, D. C.; Fourth Annual Report of the Board of Health of the state of New Jersey, from E. M. Hunt, M. D., Secretary; Ninth Annual Report of the Board of Health of the City of New Haven, Conn., from the Board; Seventeenth Annual Report of the Water Board, and Annual Report of

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the Engineer of the City of Cambridge, Mass., from W. S. Barbour, Esq., City Engineer; Natural Filtration at Berlin, by Prof. W. R. Nichols, from the author; Fourth Annual Report of the state Board of Health of Connecticut, from C. W. Chamberlain, M. D., Secretary; Worcester Sewage and the Blackstone River, from the State Board of Health, etc., Mass.; Report of the State Superintendent for 1881, from Hon. W. C. Whitford, Superintendent; Eighth Annual Report of the Railroad Commissioner, from Hon. N. P Haugen, Commr.; Fourth Biennial Report of the State Board of Health of Maryland, from C. W. Chancellor, M. D., Secretary; Effect of Student Life upon the Eyesight, by Prof. A. W. Calhoun; issued by the Bureau of Education, Washington, D. C., from Hon. J. Eaton, Commr.; The Separate System of Sewage, by G. E. Waring, Jr., from the author; The Inception, Organization and Management of Training Schools for Nurses, issued by the Bureau of Education, Washingcon, D. C., from Hon. J. Eaton, Commr.; Sanitary and Statistical Reports of the Surveyor General U. S. N., 1880; from. P. S. Wales, M. D., Surg. Gen. U. S. N.; Resuscitation of the Drowned, circular from the State Board of Health of California, by F. W. Hatch, M. D., Sec.; Blue Book of the House of Commons of Great Britain and Ireland, containing the testimony taken before the Committee to Investigate the Working of the Vaccination Act, Report of the Fourth Poor Law Conference for Yorkshire and Hart's Truths about Vaccination, from S. W. North, M. D., York, England; Small Pox and Vaccination, Copy of Memorandum of Dr. Buchanan, Medical Officer of the Local Government Board on the Present Prevalence of Small Pox in London among Vaccinated and Unvaccinated Persons respectively, from G. Buchanan, M. D. Med. Officer; Returns Relating to Births and Deaths in England and Wales, Vaccination, Small Pox, etc., Printed by order of the House of

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Commons; Returns Relating to Deaths in England and Wales, and mortality, general and infant, in England and Wales, from the Registrar General, by W. Ogle, M. D., Supt. State Dept.; Twenty-eighth Registration Report of the State of Rhode Island, from C. E. Fisher, M. D., Sec. S. B. H.; Annual Report of the Health Officer of the District of Columbia, from S. Townshend, M. D., H. O.; Transactions of the State Medical Society of Michigan, from G. E. Ramsey, M. D., Sec.; Fourth Annual Report of the State Board of Health of Rhode Island, from C. E. Fisher, M. D., Sec.; Ninth and Tenth Registration Reports of the State of Michigan; Restriction and Prevention of Scarlet Fever, Restriction and Prevention of Small Pox, The Work of Health Officers and Local Boards of Health, and Contagious Diseases, from H. B. Baker, M. D., Secretary of the State Board of Health, Michigan; First Annual Report of the Board of Health of the City of Detroit, Michigan, from O. W. Wight, M. D., Health Officer; Report on the Methods and Apparatus for Testing Inflammable Oils, based upon Investigations ordered by the State Board of Health of New York, for establishing a Safety Test of Illuminating Oils, from A. H. Elliot, School of Mines, Columbia College, New York; The Amended Public Health Laws, Powers and Duties of Local Health Boards, Organization, Powers and Duties of Local Health Boards, Duties and Proceedings of Local Health Boards and their Officers, Examples, Methods and Suggestions, with a Memorandum on contagious Disease Refuges, Temporary Hospitals for Small Pox and other Pestilent Maladies, Rules to be observed in the Public Registration of Deaths, Births and Marriages, and in the Regulation of Burials, Concerning Vital Statistics and Certified Records, Prevention of Small Pox, Duties of Local Authorities, Health Officers and Others, Memorandum of Rules to be adopted to prevent the Spreading of Contagious Diseases in Schools, Report to the State Board of Health on

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Methods of Sewerage for Cities and Large Villages in the State of New York,* and Preliminary Statement Relating to the Law for Safety-testing Illuminating Oils, all published by the State Board of Health, of New York, from E. Harris, M. D., Secretary; Protection to Bathers, Circular as to Illuminating Oils, Sanitary School Circular, To Charitable and Penal Institutions, all published by the State Board of Health of New Jersey, from E. M. Hunt, M. D., Secretary; Report of the Commissioners of Education for 1880, from Hon. J. Eaton, Washington, District of Columbia, Reports from U. S. Consuls on the Commerce and Manufactures of their Districts, from the Department of State, Washington, D. C.; Annual Report of the Board of Health and Vital Statistics of the County of Hudson, N. J., for 1881, from the Board; Adulteration and Analysis of Milk by J. Morris, M. D., from the Author.

Purchases. — Rumbold's Catarrh; The Doctor's Suggestions; Wilderness Cure; Prescott's Strong Drinks; Sanitary Care of Children; Alcohol and Tobacco; Guy's Hospital Reports, Vol. 4; Martin's Human Body; Kirkbride's Hospital Construction; Magnin's Bacteria; Blythe's Food and Poison; Beale's Microscope; Satterthwaite's Histology; Woodman & Tidy's Forensic Medicine; Wood's Library; Reynold's Medicine; Blythe's Dictionary Hygiene; Edward's Heat and Ventilation; Parry's Water; U. S. Postal Guide; Dangerous to Health; Seaton's Vaccination. The following periodicals are also regularly received: Sanitary Engineer, Journal of Chemistry, Popular Science Monthly, Journal of Education, Lancet, Sanitary Journal, Medical Record, Medical Gazette, Sanitarian.

THE PRESS.

I have once more to acknowledge the obligations of the board to the press of Wisconsin for the expressions of friendly

*By J. T. Gardiner, Director of the New York State Survey.

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feeling, and for the cordial sympathy in the work of the Board almost universally shown. With scarcely an exception the newspapers of the state have heartily seconded the efforts of the Board to disseminate sound sanitary knowledge among our citizens, and the very few instances in which such has not been the case have been the results of misunderstanding. By giving publicity to the various circulars of the Board, and by calling attention in many ways to our work, the press has rendered signal service ever since the first organization of the Board; especially has this been the case during the prevalence of Small Pox in our State; many of the papers reprinted our circulars entire, while others published copious extracts therefrom, thus bringing a knowledge of them to the people who were most deeply interested, and creating a larger demand for them than would otherwise have been raised.

EXPENSES.

The expenditures of the year are classified under the various heads of the following statement. The vouchers therefor, which have been duly examined by the committee on Finance and have received your approval, are numbered from 350 to 428, inclusive:

Official expenses of members	$427 57
Postage and telegraphing	512 12
Stationery	38 06
Printing and Binding	857 84
Books and instruments	264 70
Secretary	1,800 00
Clerical services	300 00
Transportation	72 42
Miscellaneous expenses	27 85
	$4,300 56

The figures above given would apparently show an excess of expenditure over the appropriation, which could not

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occur. The discrepancy is caused by the fact that the expense above reported is for the year ending October 31st, last, while the appropriation is for the calendar year. The expenses of the Board have been unusually heavy, partly because of the prevalence of Small Pox, but the monetary saving to the state because of this expense has been many fold its cost. The great number of localities in which the disease appeared, and the frequency with which it was arrested without going beyond the family in which it first appeared, shows conclusively that, with a few notable and blameworthy exceptions, such preventive measures as have been persistently urged by this Board, have been generally observed. Had a much greater sum been expended in this way than actually was expended, it would in view of these facts have been wise economy.

Throughout the year, as during previous years, I have associated with me in the duties of this office Prof. T. W. Chittenden, whose interest in sanitary matters is attested by several published articles in the reports of the board. To him I have been greatly indebted for valuable services rendered in the varied work which it falls to this office to do, especially for compilations from general and special reports, for which this general acknowledgement is made.

Very Respectfully,

J. T. REEVE, M. D.,
Secretary.

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The Auroraville Marshes.

THE AURORAVILLE MARSHES.

About the middle of June last the following papers were received at the secretary's office, and at the next meeting of the board they were laid before it for action:

AURORAVILLE, WIS., June 12, 1882.

J. T. REEVE, M. D.,

Secretary State Board of Health, Appleton Wisconsin:

DEAR SIR:—Enclosed please find a petition, etc., which will explain itself. The board of health in this town do not feel that they have the power to remove the nuisance complained of because of the large interests involved.

This town contains the cranberry marshes of Geo. R. Sackett, Carey Bros. and Ruddock, Rounds & Co., all of whom are wealthy and threaten the town with a large amount of litigation if any action is taken to prevent their flowing their marshes.

If the lands on which cranberries grow were the only ones flowed there would be little complaint, but such is not the case, such flowed lands being in the minority.

You will see by my report of last year an alarming prevalence of Diphtheria in the town, and there has been a number of cases since.*

Please present these matters to the State Board and advise me of its action. Yours respectfully,

S. BARKER.

The following petition, and official certification accompanied the foregoing letter:

To the Board of Health of the Town of Aurora:

The petition of the undersigned, residents of said town of Aurora, respectfully shows that there are certain lands of a marshy character situated in sections 1, 2, 3, 4, 8, 9, 25 and 26, and others in said town that are used in part for the cultivation of cranberries; that in pursuance of such cultivation and attempts thereto the owners of some of those parts used

*The registers of this board show the following numbers of cases of Diphtheria reported from the town in question: 1881 — cases, 100; deaths, 10; 1882 — cases, 6; deaths, 4.— SEC'Y.

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The Auroraville Marshes.

for such cultivation have retained large quantities of water on their said lands overflowing them, together with large tracts of land adjacent thereto, from early winter until the month of June yearly, during which said month of June said water is let off from said lands, leaving the surface of the same wet and exposed to the intense solar heat of that season of the year.

And your petitioners would further show that there has been much sickness among the people living near said lands on account of the prevalence of Diphtheria and other diseases (the attacks of which have in a large majority of cases, proved fatal) caused, as your petitioners firmly believe, by the poisonous exhalations arising from said lands because of the overflowing and draining aforesaid.

Now, therefore, your petitioners, believing that said overflowing and draining is a nuisance very dangerous to the health of the people living near said lands, respectfully petition that you cause said nuisance to be abated, and direct that said lands be properly drained.

And your petitioners would ever pray.

Dated at Aurora. April 4, 1882, [and signed by]

E. Shead,	John C. Ostrum,	L. Eldred,
I. Jenkins,	C. J. Davis,	John Lemew,
Isa. Kettlewell,	D. C. Evans,	Thos. Curran,
Jas. Blair,	John J. Clark,	W. M. Brill,
David Evans, Jr.,	J. J. Williams.	Jerome B. Eldred,
Geo. Hanson,	Zephi Rundell,	John Blair, Jr.,
Thos. Stewart,	P. S. Peck,	C. R. Shead,
S. J. Corbett,	F. H. Clark,	Chas. Shead,
F. Bronsdon,	E. Olmstead,	G. S. Shead,
W. H. Bliss,	A. N. DeGroff,	A. Jordan,
S. A. Carley,	J. E. Thomas,	H. W. Robinson,
Daniel W. Evans,	John H. VanHouten,	W. H. Davis,
Jacob Fralish,	Wm. Hughes,	A. Parsons,
John Moriarty,	Joseph Blair,	S. J. Jones,
T. Coleman,	Pat'k Quinn,	Alex. McGregor,
John Hollenbeck,	D. J. Thomas,	B. G. Bliss,
T. R. Williams,	Judson Becker,	A. Malony.
M. Coleman,	E. G. Carley,	L. J. Bliss,
Warren Nutting,	Jas. Morrow,	Dennis Hart,
Aaron Walker,	John Blair,	D. E. Jones,
G. T. Smith,	R. J. Becker,	Robt. Blair,
John Evans,	Chas. Hartfield,	Rich'd. W. Naramon,
W. J. Jones,	Sheldon Walker,	Gustave Stanitzky,
S. C. Culver.	Wm. Delaney,	Michael Albrecht,

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The Auroraville Marshes.

L. M. Kellogg,	C. Fralish,	Parmer Beulin,
Thos. G. Davis,	Wm. Shead,	Martin George,
J. A. Parsons,	M. C. Lalley,	Evan Elliss,
C. Spoor,	J. H. Lalley,	A. C. Trasher,
John Peck,	Geo. H. Hoffmann,	Evan T. Williams,
Rhienhold Peck,	Alex. Stewart,	W. M. Durfey,
Horace Osborn,	John Riordan,	C. E. Fero,
John Eldred,	H. Floyd,	Delor Hale,
Michael Fralish,	Lewis Clark,	E. Warner,
W. Eldred,	C. H. Gill,	A. J. Durfey,
Joshua Eldred,	Evan C. Ellis,	John Merritt,
M. E. Estabrook,	Wm. Barker,	B. F. Gillman,
Robt. Mitchell,	Clarence Clark,	E. Sherwood,
N. D. Allen,	W. H. Wells,	A. Strang,
Abram Fero,	M. B. Bailey,	R. R. E. Grantham,
Jas. L. Brown,	Geo. Brown,	S. L. Coville,
C. A. Davenport,	C. E. Kentfield,	D. L. Davenport,
J. B. Davenport,	Chester Clark,	David F. Clark,
G. W. Bradley,	Nathan Hodge,	D. A. White,
H. E. Adams,	John Riordan, Jr.,	B. F. Davenport,
W. A. Carley,	John Hodge,	M. C. Clark,
S. Mitchell,	Richard Towne,	D. Culver.

WAUSHARA COUNTY, *Town of Aurora—ss.*

We, the undersigned, Board of Health of said town of Aurora, having met at the office of the town clerk in said town on the twelfth day of June, 1882, at one o'clock in the afternoon for the purpose of considering and acting on the annexed petition, which said petition was presented to us on the eighth day of June, 1882, asking that the overflowing of the marshes in this town for the purpose of cultivating cranberries be stopped, and signed by one hundred and thirty-nine residents of said town; it is therefore determined as follows:

That we, the said board, believe that the said petition is just, and fully endorse the same, and that the overflowing complained of is a nuisance, dangerous to the health of the persons living near thereto, and feeling our power inadequate for the removal of the same,

It is therefore ordered and determined that the clerk of this board be directed to prepare a true certified copy of the said petition with the proceedings had thereon, and forward the same to the State Board of Health,

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The Auroraville Marshes.

asking them to take action on the same, and to send a committee to look over the lands described in said petition and, if in their opinion a nuisance exists, to abate the same.

B. F. CLARK,
A. T. CLARK,
W. H. WILLIAMS.
Board of Health.

Attest — S. BARKER, *Clerk.*
Dated at the town of Aurora, June 12, 1882.

WAUSHARA COUNTY, *Town of Aurora—ss.*

I, S. Barker, clerk of the Board of Health in said town, do hereby certify that the foregoing petition and proceedings thereon are correct copies of a petition and proceeding on the same now on file in my office, and that I have compared said copies with said originals and find them correct as to the whole thereof.

Dated at Aurora June 12, 1882.

S. BARKER,
Clerk of Board of Health.

To this communication the following answer was returned:

STATE BOARD OF HEALTH, SECRETARY'S OFFICE,
APPLETON, WISCONSIN, June 22, 1882.

S. BARKER, ESQ., *Clerk Board of Health*—Auroraville.

Dear Sir:— On my return home after an absence I find your communication of the 12th inst., enclosing copy of a numerously signed petition to your Board asking for the drainage of certain lands, the periodical and artificial overflowage of which is alleged to be the cause of much sickness, the justice of which petition your Board has endorsed, and, declaring its belief that its power is inadequate for the removal or redress of the nuisance, refers the same to this Board with request that it examine the same, and, if a nuisance be found, to abate the same.

In accordance with your request I will present the matter to the Board at the earliest opportunity, but in the meantime permit me to state that your board is in error in reference to the extent of its powers to deal with any nuisance or cause of sickness existing in the territory under its supervision as a Board of Health, chapter 57 of the Revised Statutes giving ample authority by which it may control or abate any cause of sickness which may be found therein. This power rests solely within your Board, the state Board having no such authority, as its functions in such cases are purely those of an advisory body.

All action in this case must therefore of necessity be by the local Board of

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The Auroraville Marshes.

health, and in accordance with the provisions above cited; but, while the board has ample power to abate any causes of sickness, prudence would dictate that it proceed in the case in hand with a wise caution, to establish the fact that the overflowage referred to is the cause of sickness which would be removed by the remedy sought, and that the drainage asked for is in the interest of the public health, the large pecuniary interests involved making particular care necessary, fortified as such interests may to some extent be by the provisions of the statutes relative to the cultivation of cranberries.

I would therefore respectfully suggest that your board before proceeding to formal action, make or cause to be made such careful investigation as will fully establish all the facts in the case, and shall be glad to be informed of your future action.

Very respectfully yours, etc., J. T. REEVE, M. D.,
Secretary of the State Board of Health.

The following note was also sent to Dr. N. M. Dodson, a physician residing and practicing in the immediate vicinity of the territory referred to by the petitioners, and a correspondent of the board, whose knowledge of the country in question and the amount and character of sickness prevailing therein would be of value in determining the character of the action to be taken.

SECRETARY'S OFFICE, STATE BOARD OF HEALTH,
APPLETON, WISCONSIN, June 22, 1882.

N. M. DODSON, M. D.

Dear Doctor:—The Board of Health of Auroraville has forwarded to me with request that I present the same to this board, copy of a petition signed by 139 citizens, setting forth their belief that a large amount of sickness is being caused by the overflowage and periodical drainage of the cranberry marshes of that vicinity, and praying for the abatement of this alleged nuisance by proper drainage of the land in question.

Presuming that you are familiar with the facts in the case I would be glad to know whether there is any unusual amount of sickness in that locality which, in your judgment, is fairly attributable to the cause named, together with any additional facts you may be able to give.

Respectfully and truly yours, etc.,
J. T. REEVE, *Secretary.*

To this letter an answer was received to the effect that Dr. Dodson was just then about leaving home for a time,

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The Auroraville Marshes.

but that upon his return he would investigate the matter so far as was practicable and report the result. A second letter was subsequently addressed to him, as follows:

SECRETARY'S OFFICE, STATE BOARD OF HEALTH,
APPLETON, WISCONSIN, August 3, 1882.

N. M. DODSON, M. D.:

Dear Doctor:—Your letter of June 29th ult., in reference to alleged excessive amount of sickness in vicinity of Auroraville, and the influence of overflowage and subsequent drainage of the cranberry marshes of that vicinity upon such sickness was duly received. In your letter you say that after your return from a visit to the east which you were then about making, you would investigate the matter and report your conclusions. Presuming that you have returned before this, I write to say that we shall be very glad indeed to have you, as one favorably situated for such investigation, and having an extensive and intimate knowledge of that country, make such study both of the amount and causation of such sickness as may have prevailed in the township referred to or in contiguous districts, and to have the benefit of your judgment after such study. Any necessary expenses connected with such investigation will be cheerfully met by the board.

Respectfully and truly yours, etc.,

J. T. REEVE,
Secretary.

Shortly after the date of this letter the board held a special meeting, and the foregoing papers were laid before it. The action taken by the secretary was approved by the board, and the course indicated by the following letter was decided upon.

SECRETARY'S OFFICE, STATE BOARD OF HEALTH,
APPLETON, WISCONSIN, August 18, 1882.

N. M. DODSON, M. D.:

Dear Doctor: Since I wrote you last, the board has held a meeting, and on laying before them the Auroraville petition with copies of my reply thereto, and of the correspondence had with you on the subject, it was formally voted that you be requested to inquire into the facts concerning sickness in the region referred to, and the causes thereof. if any are apparent, and particularly whether there is or has been such excessive amount of sickness as the Auroraville petition alleges, and whether the same is, in yonr opinion, due to the cause named in these letters.

For this purpose it will be perfectly proper for yon, if you desire so to do,

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to ask the assistance of one or more neighboring physicians (the name of Dr. Walbridge having been mentioned as one) if such assistance is desired, and if that will be agreeable to you. For your information I enclose copy of the communication from Auroraville, and of my reply thereto, from which you will see the scope of our powers in the premises.

This board believes that this statement and petition should receive respectful and careful attention, and that such statements should be made in reply thereto as the facts will warrant, and it further believes that your familiarity with the district alluded to will enable you to present such facts better than they could be learned by a committee formed from any members of this board. It is therefore desired that you will place the board in possession of all the facts in the case which you can learn by careful investigation, and that you will do so as soon as you have been able to complete such investigation.

Any expenses incurred in the work, together with reasonable compensation for services rendered will be cheerfully paid by the board.

Very respectfully and truly yours,

J. T. REEVE,
Secretary.

To which the following answer was received:

BERLIN, Aug. 23, 1882.

J. T. REEVE, M. D., *Secretary State Board of Health.*

Dear Doctor:—Yours of the 18th duly received. I have consulted with Dr. Walbridge; we will undertake to investigate the matter to the best of our abilities and time. To make a report satisfactory to the board and just to all concerned will require a good deal of labor, and must include, I think, a much larger extent of territory than the marshes and immediate surroundings. It would be well for us to have the petition upon which the action is based that we may have the benefit of the knowledge and grounds of belief of each petitioner, or at least of all the more intelligent ones. Please send the petition and such suggestions as may occur to you.

Very truly yours,
N. M. DODSON.

In accordance with the request contained in this letter a copy of the petition with the names of the signers was sent to Dr. Dodson; some further correspondence followed between that gentleman and this office, and with the president of this board — correspondence which related to matters of detail only and which is not essential to give in this connec-

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tion, at the close of which Dr. Dodson entered upon the investigation, having associated with himself in accordance with the authority given, Dr. J. S. Walbridge and Dr. J. M. Dodson.

The result of their inquiries is given a place here because the questions involved are of very general interest. It is proper to add also that this report having been carefully reviewed by the board, has been approved and formally adopted by it, and that the thanks of the board have been expressed to the committee for the carefulness and thoroughness with which this investigation was made.

REPORT OF THE COMMITTEE.

To the Honorable, the State Board of Health of Wisconsin:

GENTLEMEN — The undersigned your committee, to whom was referred the petition of E. Shead, J. C. Ostrom, and others, asking that an investigation be had with reference to the effects of the overflowing of certain marsh lands in the town of Aurora, county of Waushara, upon the health of the citizens, respectfully report:

That the town of Aurora contains about twenty-two thousand acres of land; that about one-third of said land is marsh or swamp land, most of which in its natural state is covered with coarse grasses, and is useful only as hay marshes or for pasturage, but by drainage and the introduction of tame grasses makes valuable meadows. Another part of this marsh land, however, consists but of deep beds of peat upon which no useful vegetation grows except the cranberry, which is indigenous, and naturally adapted to this soil.

From the first settlement of the town the gathering of this fruit has been an important item among its industries. Finding that this crop could be largely improved in quality and quantity by scientific cultivation, various persons have expended large sums of money in drainage, in the erection

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of dams, and in making canals for the artificial supply of water. This outlay has been rewarded by abundant returns to the proprietors, and by furnishing lucrative employment to hundreds of men, women and children in the harvesting of the crop.

To aid in determining the question of the effects of this cultivation upon the health of the citizens, we had prepared a map of the town, giving the location of the marshes and the whole extent of territory flowed by artificial means, and showing, also, the location of each farm and dwelling, the public roads, streams, canals and dams. We were thus enabled to locate each family and each individual, each case of sickness and each death.

The only cultivators who in any manner obstruct or change the natural flow of water, except by drainage, are Carey Bros., Rounds, Palmeter & Co. and G. B. Sackett. Carey Bros. have a canal from Willow Creek, at Auroraville, one and one-fourth miles in length, and flow about twenty-one hundred acres; the firm of Rounds, Palmeter & Co. flow about six hundred acres by means of a canal three miles in length, by which the water is brought near the marshes and from which it is lifted over a dam by steam-pumps, while Mr. Sackett, by means of dams obstructing the outflow of water naturally passing through his marsh, covers about six hundred and forty acres. We have thus three thousand, three hundred and forty acres as the entire amount of land overflowed by artificial means during a part of the year, thereby becoming the subject of this investigation. It may be well to say at this point that in the whole amount of land thus named is included some belonging to other cultivators than those already mentioned, as Messrs. Randall, Alex. Strauss & Co., C. Walter, Hamilton Bros. and some others.

The cranberry ripens in September, harvesting usually commencing about on the 10th or 15th of that month, and

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being completed by the middle of October, soon after which time (about Nov. 1st) the water is turned upon the marshes and the gates let down, so that in a few hours the land is covered to a depth varying from a few inches to two or three feet. It remains thus covered with water till about the 1st of May, when the water is turned off, the gates are raised, and the vines are given the benefit of the sun and air, that flowering and the season's growth may commence. From this time it is necessary that great care be exercised lest stagnant pools remain undrained, for stagnant, impure or too warm water is fatal not only to the growing crop but to the vines themselves, which seem as sensitive to such deleterious influences as the fish in the streams, and when once destroyed will not be replaced for years.

The water that drains into any shallow excavation made for the purpose, always seems pure and healthful,—a fairly potable water even during the hottest summer weather. Before extrême heat approaches the marshes are covered with a luxuriant growth of vines certainly not favorable to any unhealthy decomposition of vegetable matter, and the peat, of which the soil of the marshes is composed, seems hardly susceptible of decomposition at all. We have no reason to suppose that any of the ordinary forms of malarial disease originate here. Fever and Ague has never appeared among the residents here, and the cases of fever that occasionally occur are not more frequent near the marshes than at other points farther removed therefrom.

The population of the town, was on June 1st, 1880, ten hundred and eighty-two. There have been added by births and immigration up to this date (October 1, 1882) eighty-three, making a total of eleven hundred and sixty-five souls who have been subject to all existing causes of disease.

We have believed that the area included within a line extending around the marshes, at a distance of one-half mile from them might be taken, as the area within which the ef-

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fects would be most marked, if there were any danger from proximity to the overflowed lands. We have therefore divided the population into two classes, those living within the supposed dangerous district, and numbering four hundred and forty-nine, of whom two hundred and seventeen are over twenty years of age, the remaining two hundred and thirty-two being below that age, making one class, while those living more than one-half mile from the overflowed marshes form the other class, numbering seven hundred and twenty-six persons, of whom three hundred and eighty-five are twenty years old and upward, and three hundred and forty-one are less than twenty years of age.

Careful inquiry has been made at each dwelling, or of those well informed in the immediate vicinity, with reference to all sickness and deaths that have occurred since June 1, 1880, the date of the U. S. Census, to which the board is referred for information as to the deaths previous to that date. Since that time there has been little sickness of grave character and few deaths from any or all diseases other than Diphtheria. We note four cases of Pneumonia, two of Scarlet Fever, two of Dysentery, two of Bilious Remittent Fever, four of Typhoid Fever, one of Peritonitis, one of Cholera Infantum, with three deaths. There were also three fatal cases of Apoplexy, and four deaths attributed to old age. These cases of sickness and death have been so distributed as to disease and locality that no suspicion of miasm or unhealthfulness of locality could be entertained.

But it is to that dread scourge Diphtheria that the attention of the citizens has been turned, and the question has been raised whether this disease, so much more malignant than ever before, has not been caused and rendered so virulent by reason of poisonous emanations or exhalations from overflowed lands, or from the decomposition of vegetable matter left exposed to the heat of the summer sun after the waters were withdrawn.

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The Auroraville Marshes.

For the better understanding of the question we deem it necessary to give some history of the disease as it has prevailed in this vicinity, and as the town and city of Berlin adjoin the town of Aurora, they will be included in the account as also will the towns of Warren and Rushford and especially the town of Seneca, which is one tier south and one tier west of Aurora, just touching it at its southwest corner. The Fox river runs through the town of Seneca as also through the town of Berlin, giving to each a considerable extent of hay marsh, but no land adapted to the culture of cranberries, neither is there any system of artificial flowage in any of the towns just mentioned, *i. e.*, Berlin, Warren, Rushford or Seneca.

An epidemic of Diphtheria appeared in Berlin in the autumn of 1861, and prevailed with great malignity for several months, gradually losing its force, however, growing more mild and finally becoming a disease not very severe, easily managed and not very evidently contagious; still the false membrane, the swollen cervical glands, the peculiar odor of the breath, etc., marked the disorder clearly as Diphtheria. In this form the disease has continued to prevail down to the present time, having been, though quite common, very rarely fatal. We believe that the contagious principle or germ introduced in 1861, has been, whether by exhaustion through transmission from person to person during so long a time, or by other modifying circumstances, largely deprived of the deadly powers which it at first possessed. Whatever it may have been that lessened its malignity, the fact remains that no fatal cases of Diphtheria had occurred in the city for some years prior to the spring of 1880, or until the pestilence had been re-introduced in its old, intensely malignant form.

About the beginning of the winter of 1879-80 a large number of laboring men, Germans and Poles, residents of Berlin, Seneca and Warren, were employed on the Lake

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The Auroraville Marshes.

Shore & Western R. R., near Clintonville. They are said to have lived under very unhealthful conditions, large numbers being crowded into small close cabins, with little or no regard for ventilation or cleanliness.

Whether, as they claim, the disease was introduced by some newly-arrived Russian laborers, or whether from a mild form of the disease already existing the process of germ cultivation was carried on in this rich soil under very favorable circumstances, it is at least true that the younger part of these laborers, boys of from sixteen to twenty years of age, began coming home sick with Diphtheria, about the 1st of April, 1880, generally dying within a few days, and planting in each of their homes where there were children a most malignant form of the disease.

The town of Seneca had, on June 1, 1880, a population of four hundred and forty-four, of whom two hundred and forty-two were under twenty years of age. Here the first death occurred April 16, 1880, and there were ten deaths before the month ended. There were three deaths in May, three in June, four in July, four in August, two in September, and since that time nine, making in all thirty-five deaths, with only thirty-one recoveries reported.

We think that in every one of these cases a history of exposure to the contagion can be clearly traced. One family of seven children was entirely exterminated within a month; the oldest of these was also the oldest of the fatal cases that came home with the disease. From this nucleus several related families received the seeds of death. Many striking instances occurred of the wide dissemination of the disease by laborers employed in families at a distance, in neighboring towns and in the city of Berlin. It was worthy of note that our milder form of Diphtheria was still prevailing in occasional cases throughout this section, often puzzling the practitioner to know whether he had a case that he might leave to a single prescription and nature, or one

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where he had less than an equal chance to save life by the exercise of all his skill. But if he could find a history of exposure to the malignant contagion, his worst anticipations of a serious case were never disappointed.

The town of Warren, adjoining Aurora on the west, suffered at the same time, though not so severely, and the town of Rushford, lying east of Aurora, numbered its dead by the score while Aurora was yet unscathed.

But the picking time of cranberries for 1880 came and with it several hundred men, women and children, drawn together by the liberal pay offered, the novelty of the employment, something of social advantages and the sports and amusements of the hours of rest from labor, out-door work and the zest of a camp-life. They were prepared to supply their own wants; those from infected districts came perchance from sick beds as soon as they were able, and brought with them the clothing worn when sick, even the very bed-coverings from the late sick beds, still unwashed.

Thus about September 20th we find that three families, living in the flowed districts and mixing daily with the pickers, have contracted Diphtheria. From these three centres, situated some distance apart and representing two marshes, the disease again radiates and before the end of the month we have ten cases.

Since the same conditions of soil, soil-moisture, exposure to heat and cold, uncomfortable sleeping accommodations, excessive labor and imprudent amusements had never before been followed by this disease, it is fair to assume that the germs, or whatever it may be that constitutes the contagion of Diphtheria, were received and developed by reason of exposure arising from the presence of persons recovering therefrom, or of clothing, etc., worn or used by such persons during sickness.

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The Auroraville Marshes.

The following statement shows the course of the malady from then to the present time:

Months.	Cases.	Deaths.	Recoveries.	Months.	Cases.	Deaths.	Recoveries.
1880.				September.....	11	3	8
September.....	9	1	8	October	4	.....	4
October	18	6	12	November.....	1	.....	1
November.....	16	.....	16	December	9	1	8
December	10	1	9	1882.			
1881.				January	5	1	4
January	12	1	11	February	13	3	10
February	10	4	6	March.....	.....	.....	.....
March.....	12	.....	12	April	1	.....	1
April.....	.....	.....	.....	May	1	1	.....
May.....	.....	.....	.....	June	1	1	.....
June	.....	.....	.....	July.....	1	.....	1
July.....	7	.....	7	September.....	11	2	9
August.....	7	1	6				

While all epidemics depending upon paludal exhalations prevail in this climate and latitude during the months of July, August, September and October, it will be observed from the table that Diphtheria has paid little attention to seasons of the year or the laws of any other than a contagious disease. The entire absence of the disease from the town during April, May and June, 1881, was due to the better understanding of its contagious nature and greater care in avoiding exposure, and *its re-introduction in July was known to be by the employment of a servant girl only partially recovered from it*, in the family of one of the cultivators, which was immediately followed by a death in the family and the spread of the malady from thence.

Now, as already stated, there were eleven hundred and sixty-five persons who lived in the town during the period between June 1, 1880, and October 1, 1882. The number of residents has been somewhat reduced by emigration. Of these eleven hundred and sixty-five, four hundred and

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twenty-three live within our supposed danger line, that is within one half mile of lands flowed by artificial means. Among these persons there have been seventy-five cases of Diphtheria with fifteen deaths resulting, while without this territory, with a population of seven hundred and eighteen there have been eighty-four cases and eleven deaths. All of the deaths were of persons under twenty years of age, and only thirteen individuals were reported as having suffered from disease at all who were over that age. Although it thus appears that a large proportion suffered within the limit assumed, we think it a sufficient explanation that they were in daily contact and communication with the pickers from the infected districts, while the inhabitants of other parts of the town were not.

The per centage of deaths among the residents near the marshes is three and one-half; among those more distant, one and one-half, but in the town of Seneca the proportion is seven and nine-tenths per cent., and of deaths to cases, fifty-six per cent. Seneca, as already mentioned, being a town where cranberries are not cultivated, and no land is artificially flowed.

It is to us evident, that the belief that the cranberry culture was the cause of the increase of sickness in the town, arose from only a partial knowledge of the epidemic, and that the petition presented to the board was in good faith a philanthropic effort to abate the mortality and terrors of this scourge, and, while no amount of expenditure will give to this section the character for healthfulness of an elevated and dry country, we believe that the miles and miles of ditches and drains, the careful guarding of the waters, and the watchful care and supervision given to the whole system conduce to the healthfulness of the country rather than to either the origination or increase of disease.

N. M. DODSON, M. D.,
J. S. WALBRIDGE, M. D.,
J. M. DODSON, M. D.

Dated Berlin, Oct. 10, 1882.

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THE SEWER OF WAUPUN PRISON.

The following communication was received by the Secretary at the close of the month of August last:

OFFICE OF THE CITY CLERK,
WAUPUN, WIS., Aug. 29, 1882.

Honorable State Board of Health, Appleton:

GENTLEMEN: A petition, signed by seventy-five residents of this city, has been filed with our local Board of Health, setting forth that the sewer leading from the Wisconsin State Prison, and used to convey therefrom the excreta and other things of like nature, is faulty of construction so as to permit its contents to impregnate wells used for domestic purposes, and that the same emits foul and unwholesome odors prejudicial to the public health, and asking that action be taken in regard thereto.

In the opinion of our board the matter is such as requires prompt and thorough investigation in order to avert probable epidemics of such diseases as result from the use of impure water, etc. To the end that such investigation may be thorough and complete, your co-operation is invited, and I am instructed by the common council, acting as a Health Board, to request that you send such members of your Board as you may deem proper, to make such investigation with us, and suggest what in your opinion may be necessary and proper to do in the premises.

If you will inform me at what time we may expect you, our board will be ready to proceed without delay.

Very Respectfully, S. J. SUMNER,
City Clerk and Secretary of the Board of Health.

Copies of this communication were at once forwarded to Dr. Marks, the president of the board, and to Gen. Bintliff, chairman of the committee on Sanitary Inspection of Public Buildings. A few days later the copy sent to Dr. Marks was returned by him to the secretary with the following note, which he had received meantime from his excellency the governor concerning the same subject.

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The Sewer of Waupun Prison.

EXECUTIVE CHAMBER,
MADISON, Wis., Sept. 7, 1882.

DR. S. MARKS:

President State Board of Health and Vital Statistics, Milwaukee, Wis.:

Dear Sir: I have been informed that there are numerous complaints made about the improper condition of the sewerage from the state prison, where the same passes through the city of Waupun. Being desirous to ascertain the exact truth, I would request that you, as President of the State Board of Health and Vital Statistics, have the matter investigated and give me the benefit of the conclusions you reach upon the report of the investigation. I am with esteem, Yours very truly,

J. M. RUSK.

In accordance with the requests contained in the above communication, after some further correspondence between the secretary's office and other members of the board, an appointment was made with the Board of Health at Waupun by which the president of this board, Gen. Bintliff and the secretary met at that city September 14th, and as a committee of this board made a careful investigation of the sewer in question, reaching the conclusions that are given in the following reports, which embrace 1st, a formal report to the governor concerning the sewer, a copy of which was also sent to the Board of Health at Waupun, and 2d, a special communication to that board.

These reports having been submitted to you for your consideration, have received your formal approval.

HON. J. M. RUSK, *Governor of Wisconsin:*

SIR:—In accordance with the request made by your excellency, that the State Board of Health should investigate the condition of the sewer of the State Prison at Waupun, a committee of the Board, composed of the undersigned members, met at the city of Waupun on the 14th day of September last, and carefully examined the sewer in question, concerning which the following report is respectfully submitted. It is proper to state here that almost simultaneously, without your request for this examination, a similar request was received from the Local Board of Health of the city of Waupun, in which that Board alleges its belief that "the sewer is faulty in construction so as to permit its contents to impregate wells used for domestic purposes and that the same emits foul and unwholesome odors, prejudicial to the public health."

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The Sewer of Waupun Prison.

REPORT.

This sewer was built and is used for the disposal of water and excreta of the inmates of the State Prison, now numbering about four hundred. From reports made from time to time by the Wardens of the prison, we learned that the sewer was commenced in the year 1864 and completed in the year 1866; that its total length is 2863 feet; that its dimensions are, height, 3 feet 6 inches; width, 2 feet 6 inches; that both at bottom and top it is semi-circular in section; that it was laid up in "mortar lime and plastered with water lime;" that its actual cost was three thousand dollars, the work having been done by convicts, and that its estimated cost, had the work been done by ordinary labor, would have been thirteen thousand six hundred and forty-four and 92-100 dollars. Certified measurements of the City Surveyor of the City of Waupun give the length of this sewer outside of the prison walls as 2856 feet, and its total fall in that distance at 39 94-100 feet, making an average fall of about one and four-tenths inches for every ten feet; this inclination, however, not being uniform, varying from one and five-tenths inches per ten feet at the greatest, to one and one-tenth inches per ten feet at the least.

From other sources we learn that this sewer, although constructed originally for the sole use of the inmates of the State Prison, receives at two or three points in its course through apertures left in its walls, a small amount of surface drainage from the streets of the city, and that, in two or three instances, the sewer has been tapped by private parties, and for the disposal of excreta from private premises, but that all such connections have long been abandoned, there being now but one private connection with the sewer, which is at the corner of Madison and Main Street, from which it receives only the drainage of a cellar.

With this preliminary information this committee proceeded to make a personal examination of the sewer, the

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The Sewer of Waupun Prison.

course of which is as follows: After leaving the prison enclosure, and crossing diagonally a small portion of the prison property to Madison street, on which the prison faces, it runs in a straight line beneath the center of that street to Rock river, here a small and somewhat tortuous stream, into which it empties, the mouth of the sewer being beneath the bridge which crosses the river at this point. About thirty rods above said bridge is situated a mill, and a dam extends across the river at this point. At the time of our first visit, the mill having been purposely shut down for a number of hours, the water in the stream below it was very low having but little current, in which condition about one-half of the mouth of the sewer was covered thereby; at a later hour in the day, the mill being then in operation, there was much more water in the stream at this point and the mouth of the sewer was almost wholly covered.

Proceding to a more minute examination, we next caused the sewer to be opened at four different points, the first being at the margin of the prison property, the others at intervals along the course of the sewer, between the prison grounds and the river, the last being about twenty-five feet from the mouth of the sewer. At all of these points, excepting that last referred to, we found the sewer quite free from any accumulated sediment or deposit, and with a small stream of water trickling through it; the sewer was also reasonably free from any offensive odor. At the opening nearest the mouth of the sewer there was found a deposit of sewage matter about fifteen inches in depth, which was covered with some inches of water apparently set back into the sewer from the river, and having no discernible motion in either direction.

Further examination revealed the fact that the sewer was partially obstructed by the caving in of one of its walls at a point about sixteen feet from its mouth, this obstruction favoring the deposit of sewage matter just mentioned.

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The Sewer of Waupun Prison.

It is very probable, however, that a very considerable proportion of the solid part of the sewage, would be thus deposited even though no obstruction existed, inasmuch as the inclination of the sewer is here so slight that, in ordinary stages of the river, the water sets back in the sewer for a long distance, this back-set being estimated by the city engineer and the city clerk as varying at different times (*i. e.*, as the water in the river may be low or high) from seventy-five to three hundred feet or more.

The mouth of the sewer is not in the current of the river, but in practically still water. This point is of such importance as to merit particular description. The sewer running, as before stated, under the center of the street, terminates at the edge of the river and the bridge which crosses it; this bridge is elevated considerably above the river and the road-bed is raised accordingly to reach the bridge, thus forming an embankment against which the current of the river strikes very nearly at a right angle, and by which it is so turned that for several rods its course is practically parallel with that of the sewer; the main current of the stream is thus carried beyond the mouth of the sewer in such a way as to leave it, as has already been said, in practically still water, in which the heavier portions of the sewage, to some extent settle and remain, except as they are swept away by unusual currents or freshets, thus giving rise to foul and unwholesome odors at this point.

Having thus ascertained the facts concerning the construction, course and condition of the sewer, the important practical point which remained was to determine, if possible, whether there were any leakage from it which might contaminate the water supply of any of the citizens of Waupun, or whether from any cause it might be detrimental or dangerous to the health of the residents of that city. In studying these questions, the geological formation on which the city stands is worthy of consideration. It is

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everywhere underlaid by a limestone formation which is full of seams running very irregularly, which seams offer free opportunity for the passage of currents of water from place to place. This formation generally lies close to the surface, and forms as we were told a part of the floor of the sewer, other portions of the sewer being blasted through it. It forms also the bottom of many cellars, some of which we examined, finding small water courses in the seams above described; we were informed, moreover, that it was an exceedingly difficult task to cement these cellars, as the water pressing up through the seams in the rock from below would break and force off the cemented coating.

This history led us to fear that the same thing might have occurred in the sewer and that its walls were pervious, and to seek for some method by which we might ascertain, if possible, whether this were the case and whether sewage were finding its way into the wells of the citizens. For this purpose no more practical or feasible plan suggested itself than that of placing in the head of the sewer some substance which, mingling with the sewage, would find its way therewith into the wells in the event of there being any channel of communication between them and the sewer, which could not by any reasonable probability reach the wells from any other source, which could be with readiness and certainty detected if there, and which, in the quantity that might get into any one well, would be harmless to those using the water. Such an agent seemed to offer itself in the Ferrocyanide of Potassium (the Yellow Prussiate of Potash of commerce) a salt readily soluble in water, harmless in any possible quantity that could filter into the wells, and giving chemical reactions not to be mistaken even when present in exceedingly minute proportions. It was believed that a small quantity of this salt placed in the sewer on several consecutive days could not fail to permeate wherever the sewage water might go, but in order to

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render its doing so as certain as possible it was determined to use an excessive amount.

Accordingly arrangements were made with a trustworthy person to place fifteen pounds of the salt in the head of the sewer each evening for five consecutive days, while arrangements were also made to have samples of water taken from all the wells that could possibly receive any of the sewage for ten consecutive days after the first placing of the salt in the sewer, and on the fourth, seventh and tenth days after the expiration of that time. These samples of water were collected by the Local Board of Health and forwarded to the office of this Board, where they were carefully and patiently examined to the number of two hundred and seventy-three, first with reference to the presence of the salt referred to, and second with reference to the presence of sewage matter and other impurities from any source. These examinations of necessity occupied much time and have delayed the making of this report. The result however has been that, while in a considerable portion of the specimens of water examined, sewage matter was undoubtedly present, in no single instance was there found the slightest evidence of the presence of the agent with which we were working in any sample of the water examined. We are therefore clearly of the opinion that there is no evidence that any of the wells of the city of Waupun have thus far suffered contamination from the prison sewer; neither has any evidence been presented to us of injury to the health of any of the citizens by reason of odors arising from said sewer, although we were satisfied from personal experience that odors of decidedly unpleasant character do emanate from thence.

While recording these facts however, we do not think that we should be fulfilling our whole duty in the premises were we to stop short at this point, and say simply that *there is no proof of injury* arising from this source. Our examination of the sewer and the knowledge obtained thereby

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of the character of the rock formation upon and through which it is made, leads us to fear that the danger apprehended by the Waupun Board of Health may in the future be found to exist. To avoid its occurrence at least to a great extent we therefore recommend: *First*; such changes at the mouth of the sewer as may be necessary to bring it fully into the main current of Rock River. *Second*; such additional water supply at the prison as will render practicable frequent and forcible flushing of the sewer, the present water supply of the prison (which is not more than sufficient for its ordinary use) being wholly inadequate for the purpose. This might necessitate the sinking of an additional deep well and the construction of an additional storage tank which could be rapidly emptied into the sewer as occasion required. It may also be said incidentally that the usefulness of such increased water supply would be apparent in case of fire at the prison. *Third*; that in view of the manifest impropriety and danger of discharging a large quantity of poisonous' sewage matter into so small and sluggish a stream as is the Rock River at this point, the use of the sewer for disposing of the excreta of the prisoners be abandoned and that the dry earth or earth closet system be introduced in lieu thereof, a system which we are the more earnest in recommending here because we believe the entire city of Waupun (including the prison) from the geological formation on which it rests, to be a place where the danger is especially great that the water supply will be contaminated by the filtration of sewage or other material through the soil, and where therefore the adoption of the dry earth system of disposal of the excreta of its inhabitants, should, as far as possible displace both sewage and privy vaults.

In closing we acknowledge our obligations to the authorities of the prison, and to the Board of Health at Waupun

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for their courtesy in extending every facility and for all necessary assistance in conducting the investigation.

In addition to the above report to the governor the following communication was made to the Board of Health of Waupun:

GENTLEMEN:—The report made to the governor of the state upon the condition of the sewer connected with the prison in your city, the conclusions to which we have come in reference thereto, and the recommendations that we have felt it incumbent upon us to make, are all embodied in the paper which precedes this communication, which has already been forwarded to Madison for such consideration and action as may be deemed proper by the executive of the state.

There are some points, however, in connection with the investigation, which, while they could not properly be mentioned in our report to the governor, are yet of special importance to your city and its residents, and of these points we desire to speak more particularly in this communication.

The examination of the many samples of water forwarded to us from Waupun was directed more especially as a matter of course, and as was desired by yourselves to determining whether any connection existed between the sewer of the prison and the wells along its course — whether there were any channels of communication through which the contents of the sewer might reach and poison the water used by your citizens and their families, as indeed it seemed very probable might be the case, in view of some of the facts discovered during our inspection; the methods to be used in answering this question were carefully considered, and very delicate chemical tests with careful miscroscopic observations were employed in the determination, the result being

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as stated in the report to the governor, that no evidence was discovered tending to show that any such channels of communication probably exist, or that any infiltration from the prison sewer to the wells has taken place.

Notwithstanding this fact, many of the samples of water examined were found which presented clear evidence of contamination from some source, several of them to an extent that renders the use of them in their present condition very unwise and imprudent. We cannot say that disease germs are or are not present in them, because the means that chemical and optical science have placed at our disposal are not yet sufficient for this; but the existence of such germs in water contaminated by sewage has been too often proven by outbreaks of specific disease, to render safe the use of water in which sewage contamination is shown to exist.

The tests applied, in addition to the special chemical test used to determine whether there were any infiltration of the contents of the sewer into the wells along its course, were three in number; first, Heisch's sugar test to ascertain the fact of sewage contamination; second a test for Chlorine in excess, and, third, careful microscopic examination for various forms of animal life and suspended impurities generally. In quite a number of the samples sent only ordinary eyesight was necessary to show the presence of animal life in great abundance; several samples are, at the time of writing, preserved in this office, which support many curious specimens of such life in vigorous activity, and which contain abundant material for their support in the form of decaying vegetable and other matter; the samples marked No. 9 in the various lots sent were all of this character, and no very careful examination was needed to show that the water of this well in its present condition is unfit for use. Several of the samples marked No. 7, also presented specimens of animal life visible to the naked eye. The samples marked No.

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12, usually contained much sediment, which seemed to consist of decayed vegetable matter in which sand was mingled.

The results of the first test applied as above mentioned were to show that Nos. 9, 10 and 12 were all more or less contaminated by sewage infiltration. The second test showed Chlorine in excess in Nos. 1, 2, 9 and 10, in a smaller proportion in Nos. 4, 7 and 12 and in less quantities in the other samples, No. 16 containing least of all. It may be remarked, incidentally, that the samples taken from this well (No. 16) showed it to be a water of as good character as it is reasonable to expect in any well situated within the limits of a city. It is right to say that we have no knowledge of the relations of these wells to each other, or to the sewer, but your attention is called to the fact that some of the samples sent by you for comparison, and which were said to be taken from sources where no connection with the sewer was possible, gave decided evidence of sewage contamination.

Thus it seems evident that there is in Waupun some cause operating over different parts of the city, which produces contamination of the water supply to an extent that renders the use of the water in many cases dangerous, and the fact that an excess of chlorine was found in so many of the samples, points to one of two sources of such contamination.

Chlorine is found to a greater or less extent in almost all natural waters, its source being the rocks and soils through which the water percolates, but it is always more abundant in wells and springs found in thickly settled localities than in streams and springs in sparsely settled districts; its source in the former locations is chloride of sodium, better known as common salt, which forms a constituent of all animal excreta, sweat, urine, feces, etc., and hence its presence in water in anything more than a very small quantity, gives

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grave reason for suspecting contamination, either by the refuse water from house drains or waste thrown upon the surface of the ground, or still worse, by infiltration from privy vaults.

That this danger is by no means an imaginary one, very many too well authenticated instances show, and Waupun is by no means an exception to the general rule; rather does it seem to us that the danger of contamination to the water supply by this means is especially great in your city, owing to the peculiar rock formation on which it stands to which reference has already been made in the report to the governor.

The recommendations made in that report to abandon the prison sewer as a means of disposing of excreta, and for the substitution of earth closets or some other form of the dry earth system of disposal of these maters at the prison, are applicable also to the city of Waupun, and we recommend to your consideration the passage of an ordinance requiring the removal of the contents, the thorough cleansing out, disinfection and subsequent filling up of all privy vaults as ordinarily constructed, the entire prohibition of the future construction of such vaults unless they conform to certain sanitary rules to be strictly enforced, and the general introduction throughout the city of the dry earth system of disposing of all excreta. We also reccommend the abandonment of all cess-pools and all similar receptacles for household waste, and the prohibition of their future construction unless under the same restrictions as shall govern the construction of privy-vaults. We believe that only by some such radical and far-reaching reform, can the purity of the water supply of your city be preserved and the dangers which now threaten the health of your citizens be averted.

With the renewed expression of our thanks for the courtesy

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extended to us on the occasion of our visit to your city, and the facilities offered in conducting the investigation, we remain

Very respectfully yours,

S. MARKS,
J. BINTLIFF,
J. T. REEVE.

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Hints Concerning Infantile Hygiene and Dietetics.

HINTS CONCERNING INFANTILE HYGIENE AND DIETETICS.

BY KNUT HOEGH, M. D., OF LA CROSSE.

The mortality of infants is great in all countries, and while it may be less in the United States than elsewhere we know it to be formidable even among us. From 1856 to 1870 there died in Massachussetts, in each year, nearly fourteen out of every one hundred children under one year of age. This must indeed be called a heavy rate of mortality, and a disgrace to our civilization, which prides itself upon its respect for human life, and it becomes the duty of the sanitarian to examine into the causes thereof and to see whether they can be removed.

Every-one who is familiar with the way in which infants are usually brought up in our communities, and who has given any attention to the subject, will admit that there is room for improvement, but while well-informed physicians are agreed upon the proper principles of infantile hygiene and diet, we see many mothers and nurses who persist in traditional mistakes that need only to be pointed out to intelligent persons to be abolished. It is to be deplored that a great many of those who are concerned in these matters, are too conservative to adopt improved methods, and often too ignorant to understand their own deficiency.

Diseases of the digestive organs or of some part of them, cause more deaths in infants under one year than any other class of illness, and since, in a great number of cases, they may be attributed to improper feeding, attention will first be called to the subject of

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Hints Concerning Infantile Hygiene and Dietetics.

DIET.

Care for the proper nourishment of the child ought to begin before its birth. The child, subsisting upon its mother's blood, should be provided with blood of the best quality that the mother can give, and it therefere becomes her duty to live according to the generally recognized laws of health; she should be moderate and regular in her diet, avoid every kind of excess, take exercise in the open air, and pay attention to the regular performance of the functions of the organs of excretion. She must attend to the breasts, and try to enable them to perform their important work in a reliable way, and should put them into a healthy condition at an early period. A large number of women have small nipples. scarcely rising above the surface of the breasts; others again have nipples so tender that they crack and become sore as soon as they are put to their proper use. The pressure of tight clothing is probably a frequent cause of these conditions, and should therefore be avoided. The care of the breasts ought to begin in the middle of pregnancy, by frequent washings, at first with plain water and soap, and later with alum water or brandy. For those with a very delicate skin, washing with tar-water, or the occasional application of a mild tar ointment will often be found beneficial. Where the nipple is very small it may be made more prominent by the use of a breast pump, or still better, by having some one draw it out by sucking. To assist in keeping it in its proper shape, a so-called shield may be used; this is of hard and smooth material, having a hollow prominence designed to receive the nipple and protect it from pressure. A nipple may at the time of birth be very small, so that the newly-born baby may be too weak to draw it out; an older and stronger child or other person should then try to do so and will often succeed; such an attempt must however always be preceded by a careful examination as to the individual's health, since some of the most dreadful contagious diseases have been

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communicated through the act of nursing. A competent physician must thoroughly investigate matters, as anyone else will frequently overlook important signs of a diseased condition. After child-birth the breasts need continued careful attention; whenever the child has nursed, the nipples should be washed with warm water to remove any remnants of milk that might else become decomposed and unduly irritative, or cause cracks and ulcers; they should also be kept covered with some soft and warm material that will absorb moisture and protect against changes of temperature.

When the labor of childbirth is over, and the mother is comfortably fixed in bed, she frequently falls into a refreshing sleep; as soon as she wakes the child should be laid to her breast, when it will make a short attempt at suckling and then let the nipple go, to repeat its efforts a few minutes later. Every two or three hours it should be offered the breast, although there is but little milk for the first two or three days. In this way the child usually gets what it needs, while the effect of sucking the nipple is very beneficial to the mother in whom, by a peculiar action, it produces contraction of the womb, with expulsion of the blood that may be collected there, and the shutting up of the gaping blood-vessels of the internal surface. An infant may cry a good deal for the first two days, and this is generally supposed to be from hunger; different kinds of food are given but usually with no beneficial result. When a child shows signs of distress it should be undressed and examined; tight clothes ought to be loosened, and a warm application, for instance, a warm saucer wrapped in flannel, should be made over the stomach. Restlessness is often due to pains in the bowels, perhaps produced by the action of the first milk which is gently laxative. Medicine should never be given to an infant except upon the recommendation of the physician. When it becomes necessary to give a new-born infant food in the

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absence of mother's milk, then, well-boiled barley-water, strained, sweetened and mixed with one-sixth part of skimmed and boiled milk, is the best substitute for the natural food.

After two or three days a richer supply of milk from the mother's breast gives the child abundant nourishment, and sometimes even more than it can digest; part of it is vomited to the great benefit of the child who else would suffer from the too abundant nutrition. The infant need not be nursed any oftener than once in two hours, and gradually with longer intervals, so that with the beginning of the second month it is put to the breast only once in every three hours. At night the intervals are lengthened to allow the mother more rest and sleep, which she needs as well as food to preserve the vigor of her nervous system; if this be considerably impaired, she becomes a poor nurse, giving milk deficient in many important matters, as phosphatic salts and caseine (cheesy matter), substances that the child cannot do without. It is remarkable how easily children will get the habit of regularity in their meals, and this is of great importance for them as well as for adult persons, who usually never feel quite well except when taking their meals and sleep at regular hours. The nervous system has a tendency to perform its functions at regular intervals, and when the meals are taken regularly the sleep is also more regular and so are the functions of the bowels. Prudent mothers begin the education of their children from their earliest infancy, by forming habits of regularity and moderation. Regular hours for nursing have this additional advantage, that they allow mothers greater liberty in leaving their children to the care of others, while those who accustom the babies to nurse at all hours are obliged to remain in very close attendance upon them for months. It is hardly necessary to add that such children cry a good deal because they suffer from

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pains brought on by the indigestion that results from too frequent feeding.

When the child is about six months old and healthy, the mother may begin to give it some artificial food. This may be done by a nurse-girl in the middle of the night to economize the strength of the mother, who frequently begins to show signs of debility after some months of nursing. The artificial food ought to consist of cow's milk mixed with some diluent as water, barley-water or gum-arabic-water as further explained below.

Experience sufficiently shows the diffierence between children that are nursed by a healthy mother, or wet-nurse and those who are raised on artificial food; mothers who have tried both plans do not fail to appreciate the advantages of nursing, and the experience of foundling hospitals, where children are from necessity, brought up on artificial food, is very discouraging. The death-rate of some large cities, where the manner of feeding children has been investigated, shows emphatically the dangers connected with artificial feeeding.* The mothers are also benefited to some extent by nursing, the milk carrying off some substances that have performed their work, and which find a natural outlet from the body through the milk. The interests of the mother and child are not conflicting in this respect, and every mother, whose health permits, has the duty of nursing her baby.

Many women who originally have but little milk, and who would have absolutely none if they gave up nursing, may by persistency and proper nourishment produce a very satis-

*(NOTE) In the city of Munich, Bavaria, official statistics for the years 1868–70 show a mortality of 8,309 infants below six months; of these 7,078, nearly 85 per cent., were nourished on artificial food, while only 1,231, about 15 per cent. were nursed. In the absence of numbers expressing how many children of each class survived, these percentages have of course no absolute value, but still they point decidedly to the greater safety of breast nursing.

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factory supply; efforts in this direction, therefore, should not be easily given up. If the child does not increase in strength and weight artificial food must be added, but nursing should be continued if the child gives no evidence that the milk is injurious; such evidence would be Diarrhœa, great restlessness, etc. Anæmic women usually give poor milk and their children show by their lack of fat, and by digestive disturbances that they are improperly fed. Such a child should have a wet-nurse if circumstances permit; if not, artificial food should be used. If, however, a child thrives and grows it may be safely concluded that the mother gives sufficient milk of good enough quality. Chronic and constitutional diseases that seriously impair the health, usually unfit a woman for the office of nursing; so also do Epilepsy and other grave nervous disorders connected with spasms and cramps; even a very passionate temper may prove a bar to successful nursing, as children have been taken violently sick after some nervous disturbance of this kind in the mothers. Some mothers may make their milk injurious by partaking of certain foods that easily affect the milk; such are, for instance, cabbage, onions, certain condiments, ice-cream, etc.; others may safely enjoy such substances, but care should be exercised, as they may do harm. Many mothers are in the habit of drinking beer or wine during the period of nursing; small quantities of such beverages may be permitted if the mothers are accustomed to them, but excess is certainly injurious, and the children are better off if the mother can get along without any form of alcoholics. Women who nurse should abstain as far as possible from the use of medicine and should never take any, except by direction of a competent physician who is aware of the fact of their nursing.

The appearance of menstruation, which in many women comes a few weeks after childbirth, ought not to preclude nursing if the mother's health remains good and the child

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continues to thrive. It is otherwise with pregnancy, which is justly considered an objection to continued nursing.

If the mother cannot nurse and a wet nurse cannot be had, the usual and best substitute is an admixture of cow's milk. The milk of the ass or goat is sometimes recommended as preferable, but it is not always easily procurable, and there is no reason for believing it superior to that of the cow. Although cow's milk resembles human milk very much, there are still some important differences which make it, unmixed, a less desirable food. It contains more caseine (cheese and butter) than human milk, less sugar, and is less alkaline; what is more important still is, that the caseine in the two kinds of milk is somewhat different in its chemical relations, and behaves differently in the stomach; the human milk coagulates in thin, fine flakes, easily penetrated by the digestive juices, while cow's milk forms larger, more solid curds not so easily accessible to the action of the gastric juice. To be sure of a good supply of milk it should be taken from a dairy, where cows are kept in good sanitary condition with cleanliness, fresh air and healthy food, mainly consisting of hay and bran. Ordinary good stock, that gives an average good milk is to be preferred to high-bred cattle, that give a very fat milk. It is a common belief that the milk of one cow is more conducive to the baby's health than the mixed milk of a herd, but the best informed and most experienced physicians no longer entertain this idea. The milk of a whole herd is likely to approach the average milk more closely, and to be more uniform in composition than that of a single cow in which accidents of feeding, fatigue or ill-health may cause a deviation from the normal standard. It is best to get milk both morning and evening, that it may be always fresh, but, if this cannot be done, and milk can be obtained only once a day, the morning milk is preferable as being less rich in butter. It must be kept in a cool place, if in an ice-box, not in the

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same compartment with victuals, from which it will readily take their peculiar flavors. It is well to add one tablespoonful of a solution of carbonate of soda, (made by dissolving one drachm of bicarbonate of soda in six ounces of water), or four tablespoonfuls of lime-water to each pint of milk.

Usually cow's milk is mixed with different articles to make it resemble human milk more closely, and to prevent the too rapid and complete coagulation of its caseine. The most common admixture is water with a little sugar and some bicarbonate of soda, but a better one is barley-water, gum-arabic-water or thin oatmeal gruel. To infants below two months of age it is proper to give two pints of this admixture to one of skimmed and boiled milk; to older children proportionately more milk should be given.

To prepare barley-water whole barley is procured, ground at home in a clean coffee-mill, and one teaspoonful is boiled with six ounces of water for twenty minutes, or even more for very young children. This decoction is strained through a cloth, and a little sugar and a very little salt are added. Oatmeal may be prepared in the same way and will be found useful when the child suffers from costiveness, while barley-water is preferable where the opposite condition prevails. For older children the barley or oatmeal gruel may be made somewhat thicker. Sugar must be added in a very moderate dose, *e. g.*, one-third of a teaspoonful to four or six ounces of nourishment. An excess of sugar is apt to give rise to digestive disturbances and sore mouth.

It is quite a common notion that exclusive fluid food is insufficient, and pap, mush, crackers, etc., are very popular as infant foods. But these are not suited to very young infants because their prevailing food-element is starch, and starch is not easily digested by the new-born child, whose salivary glands are but slightly developed. The office of these glands and partly that of the pancreas also, a gland lying behind the stomach and popularly known as the sweet-bread, is to

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produce saliva that changes starch to sugar, and thereby makes it digestible; in the first months of life the saliva is smaller in quantity and less efficient than later. With the appearance of the first teeth the development of these glands is so far advanced that starchy food may be gradually introduced. Barley and oatmeal water certainly contain some starch, but not in great quantity, and, further it is more easily digested than is the starch of wheat, potatoes and corn-meal.

There are some children who cannot digest milk or any mixture of milk, and some children who can usually do so, cannot digest it at all times. Such children will usually get along with barley water or oatmeal gruel for a long time. Condensed milk mixed with five or six times its weight of water is sometimes tolerated where ordinary milk is not. In extreme cases, where all these preparations fail, the so-called "Liebig's Artificial Milk" might be tried. It is prepared in the following manner: one ounce of wheat flour is boiled with ten ounces of milk for three or four minutes, and then allowed to cool off to 90 degrees Fah. One ounce of malt powder mixed with fifteen grains bi-carbonate of potassa, and two ounces of water is then stirred into it, after which it is put into a corked vial and allowed to stand one hour and a half at a temperature of 100 degrees to 150 degrees Fah. It is then again put over the fire and allowed to boil gently for a few minutes and is finally carefully strained.* The only objection to this preparation is the amount of care and precision required; if not accurately prepared it may be harmful instead of beneficial.

Infants ought to be fed from a glass nursing bottle, with a short, black rubber nipple perforated by small holes in the end. It thus becomes necessary to hold the child in the arms or on the lap when it feeds, but this is preferable to using a bottle with a long tube which allows the child to

* From Dr. Jacobi's "Infant Diet."

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nurse in the cradle; this practice is injurious because the tube cannot be kept sufficiently clean, and because the child is allowed to go to sleep with the nipple still remaining in its mouth, where the last unswallowed drops of milk soon undergo decomposition which easily proceeds further down the alimentary canal. If any food is left in the bottle when the child has finished nursing it should invariably be thrown away, as it becomes unfit for use after it has remained in the bottle a few hours; especially is this the case in hot weather. Fresh barley or oatmeal water should be made for each meal. The bottle must be cleaned with strong soap-suds, then washed out with hot water and rinsed with cold water in which it should be kept until needed for use. The nipple must be cleaned in the same scrupulous way, turned inside-out, and scrubbed with a brush kept for that purpose. There should be at least two bottles and four nipples to allow sufficient time for cleaning. It may be asked whether all this trouble cannot be avoided by allowing the child to drink from a cup, or to be nourished with a spoon, but in this way a child would swallow its food too rapidly, and would not get it mixed with saliva, which is produced in greater quantity during the act of sucking, and which is important for the complete digestion of the food; sucking is moreover likely to be a useful exercise for the child, whose muscles need some work.

A very common mistake in feeding consists in giving the child more food than is necessary. This is only to tax the digestive powers unduly and leads frequently to habitual constipation. In the summer time, when the nervous system is somewhat depressed by the heat, the evil consequences of this over-feeding appear most strikingly; the child has Diarrhœa, loses strength rapidly, and frequently finally succumbs. These Diarrhœas are usually looked upon as the result of teething, and are allowed to run their course until they cannot be stopped. But their true explana-

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tion is that the digestion which, in cool weather, was able to contend with considerable success with the heavy burden imposed upon it, becomes unequal to the task when the child's strength is impaired by excessive heat. "Summer complaint" is thus a very proper name for this disease, which may usually be avoided if children are given less food and more water during the hot season, and if they are kept cool by proper attention to baths, sponging and ventilation.

The process of weaning should be gradual if possible; children should have at first only small quantities of artificial food once in twenty-four hours; when they reach the age of from five to eight months, if they are healthy, they begin to crave more than they can get from their mothers, and when they are from nine to twelve months old they are usually able to live without nursing. There is quite a large number of articles manufactured on a grand scale, and forming important matters of trade, that have succeeded in becoming very popular as foods for children. While some of them may not be quite destitute of merit, it is safe to say that the majority owe their popularity, not so much to their intrinsic value as to the extent and manner in which they are advertised, and to the profits derived from their sale.

Children should not be weaned during excessively hot weather, nor when they are temporarily suffering from any illness. If they are nursed too long the maternal milk becomes less nutritious, and the mothers begin to assume a pallid appearance and to suffer from anæmia, with headache, impaired digestion, weakness in the back, pains in the limbs, disturbed sleep and other symtoms of nervous exhaustion.

Fresh air is as necessary for the child as for the adult and should be liberally provided. The infant may be put into the mother's bed, well covered, and the windows may be

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opened several times a day without exposing either of them to any undue risk. The fear of taking cold is exaggerated, and entirely groundless if the child is in a good bed and the cold air does not strike it directly; by overheating the room and keeping the foul air in, the conditions are given that produce both colds and other disorders. In the summer, when the buildings in populous cities have been overheated by the sun during the daytime, they retain their heat during the greater part of the night, and this is a very dangerous condition for infants, who can endure heat a great deal better if they get nightly intervals of a more endurable temperature.

When the excessive heat acts uninterruptedly, the nervous system is prostrated sooner and more completely than when cool nights give it a chance to overcome the effects of previous days. Under such circumstances windows must be thrown open and the child bathed frequently and sponged with cool water. The clothes and the bed coverings must be of the lightest kind. The child should drink water freely and the amount of food should be lessened. In the daytime the dress should be very light and the child must be carried in the arms as little as possible; it is well to allow it to lie on a quilt spread on the floor, if it be old enough to do so. Simple and self-evident as all this seems to be, daily experience shows how little people understand the danger of heat and the proper way of guarding against its evil influence. In the winter and on cold days the opposite conditions prevail, and the child should then be protected by warm clothing leaving no part of the body except the hands and face exposed. In our climate light flannel, outside a thin cotton shirt is necessary as well as woolen stockings. The temperature of the air should be the guide to the amount of clothing needed, as it should be the aim to allow the child to be out in the fresh air daily except on extremely cold or rainy days. The clothes should be loose so as not to interfere with

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breathing or the easy movement of arms and legs; they should be of fine material that they may not chafe the skin.

Cleanliness of body and clothing needs only to be mentioned, as everyone is familiar with its importance. Baths morning and evening are necessary for children under three months old; their cooling effect makes them specially valuable in summer.

In carrying children in the arms care should be taken not to carry them habitually on the same side as this tends to make them one-sided, a condition that may be frequently observed in all the children of a mother who can nurse only from one breast. Not only the bodies, but the heads and faces of a whole family can sometimes be seen drawn over to one side. The only remedy is to change the position frequently, a very difficult thing for such mothers to do, but something that good-will and attention can accomplish.

It would finally be proper to warn against one or two of the more common abuses to which newly-born children are exposed by their nurses. One of these consists in pressing of the nipples until a drop or two of the secretion which is in them at birth is forced out. This does no good but produces unnecessary pain and frequently inflammation of the breast with its attendant dangers. Another abuse to which infants are exposed is the cutting or tearing of the "tongue-band;" although this interference enjoys a venerable antiquity and very general popular sanction, it is usually uncalled for, and is an unjustifiable cruelty.

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NOSTRUMS.

BY PROF. THOS. W. CHITTENDEN, OF APPLETON, WIS.

Just one hundred years ago a learned English physician wrote as follows: "In the last century and in part of the present one the Pharmacopœia and shops were overloaded with syrups and distilled waters, simple and compound, with boles, conserves and an ostentatious heap of compositions, loathsome or insignificant. The shops have very properly, if I may be permitted a technical phrase, been purged of a considerable part of this trash, and imperial, alixipharmic and heavenly waters, exhilarating confections for the heart, whets for genius, pearl juleps, clays, boles, volatile acid spirits and distilled oils are now all banished." Could the doctor "re-visit the glimpses of the moon" to-day, and inspect the shelves of almost any druggist in the United States, and read the advertising columns of the newspapers, he would be compelled to think the conclusion chronicled above somewhat premature, and that the "trash" had only changed a few of the numerous names that it bore in his own day, remaining in all essential respects the same thing.

It is practically impossible at the present time to take up any popular newspaper or periodical, be its character whatsoever it may, whether literary or scientific, the organ of a trade or a political party, whether devoted to the interests of art or religion, without finding a very considerable portion of the advertising space taken up by the announcements of the makers, proprietors or venders of nostrums; and not only in the space devoted to business announcements are advertisements of this class to be found; probably there are very few newspaper readers to-day who have not been tricked into reading some pretended anecdote of

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Nostrums.

one or another prominent personage, some seemingly interesting statement of scientific fact, some counterfeit item of news, or some apparent *jeu d'esprit*, which in the end has proven to be an ingenious trap leading to the tumid puff of some nostrum, which, had it appeared in its own proper place and guise, would have been passed over with the contempt that it deserved; such announcements are thus obtruded into editorial columns, among telegraphic dispatches, items of news, in brief into every portion of journals, hebdomadals and monthlies of all classes. Seemingly with a view to insure the perusal of as many advertisements of this sort as possible, some journals even provide a special column in which appears a regular alternation of facetious notes or anecdotes with apparent editorial commendation of all the nostrums which are regularly blazoned forth in other portions of the sheets.

So prominent and marked a feature of the advertising of our day, cannot be without significance from a sanitary point of view, and we are led to inquire who are the purchasers of the thousands of articles thus thrust upon our notice, and what is the character of the articles themselves? An answer to the first of these questions, were it complete, would probably reveal a very singular state of things; it would be found that it is by no means the ignorant and illiterate only among whom the chief purchasers of nostrums of all kinds are to be looked for, but that men and women of so high a degree of intelligence, that they would upon no consideration purchase for their tables an article of food or drink concerning which they had no knowledge whatever, people who search the markets through to find soaps of acknowledged purity for their bath-rooms and wash-stands, will yet buy so-called panaceas, of the constituents of which they know absolutely nothing, the compounders of which in many cases preserve a mysterious incognito, and in many others assume names to which they can lay no truthful

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claim, and who in the most favorable instances are and must be wholly unknown to those who consume their wares "There are ague medicines," so runs the best argument in favor of what seems fearful recklessness, "cathartics, preparations to stimulate the liver or other great secreting organs, to loosen coughs, to stop diarrhœas, to help digestion, and there are many of these remedies and appliances which *our friends tell us from experience*, are good and helpful. People need no prompting to call in the doctor when anyone is really sick, but there are minor ailments and discomforts which some one of these specifics *will hit nearly enough for the purpose.* A visit from a physician costs from a dollar upward; may not a fifty cent bottle of some preparation answer the same purpose?"

It seems incredible that men of shrewdness and ability in regard to other matters should argue thus, but that they do, is an unquestionable fact and must be accepted and dealt with as such. It is easy to ask how the man or woman having the usual amount of knowledge concerning the human system, and its workings in health and disease can tell whether a cathartic, or a preparation which claims on its label to be able to "stimulate the liver or help digestion" is the exact thing needful in his own particular case, or on what principle he proceeds in deciding that a diarrhœa should be stopped; and it would probably puzzle the majority of people to decide whether a headache or like seemingly "minor ailment and discomfort" is actually such and such only, or the fore-runner of some serious, perhaps fatal malady, and whether or not some fifty-cent, advertised specific will really "hit near enough to answer the purpose." If moreover, the friends who are so ready to assure us from the vastness of their own experience, that this or the other dose is good and helpful, were asked on what the confident assurance is based, or what ground they have, admitting that they

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know the goodness and helpfulness for themselves, for their certainty that the same remedy will exactly suit the case of another, the inquiries might prove somewhat perplexing. Yet it is almost invariably the case, that the only knowledge of any nostrum in the possession of those who purchase and use it, is derived either from the advertisement of the stuff in the columns of some newspaper or magazine, or from some one who, knowing nothing more than this, has used it himself for some perhaps fancied ailment and has received equally fanciful benefit, or who has known, or more probably has heard, of a third party who has had, or fancies that he has had, such an experience.

Concerning the ingredients which go to make up the compounds under discussion, nothing whatever is known by their consumers; it is true that many of them have been analyzed by competent chemists with results hereafter to be spoken of, but such analyses rarely if ever come to the knowledge of those for whose benefit they are made; they are usually published in medical or other strictly professional journals, whence they are seldom if ever transferred to the columns of the daily press; this ignorance, however, does not prevent recommendations being given, any more than does the want of other knowledge to which allusion has just been made; so far from it, the fact that such ignorance exists is practically denied by the use of such terms as "well-known medicinal agents, famous proprietary medicines, far-famed remedies," etc. In very many instances the name borne by a nostrum is a lie, inasmuch as the mixture contains none of the ingredients from which it is believed to derive its virtues. This has been repeatedly proven by analysis, and was conspicuously shown some years ago in the case of a class of compounds as widely advertised and extensively used then, as is any nostrum whatever to-day—the so-called sarsaparillas, which every one of middle age or over will remember. Repeated examination had shown that iodides and

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mercurial salts, generally chlorides, were the chief agents in producing whatever benefit was due to the use of these preparations, but, notwithstanding this fact, their makers had the amazing assurance to publish advertisements headed with "Why ruin the health with calomel?" and similar questions. The point which finally pricked this bubble was probably an article that first appeared in a popular medical publication giving the following facts: A large drug importer in the city of New York found himself pressed for money at a time when a large quantity of sarsaparilla-root of very fine quality had just reached his warehouse; he went to a noted maker of so-called sarsaparilla and offered to sell the root at a very low figure but his proposal was declined. He went to a second "sarsaparilla maker" and a third, but meeting with no better fortune, and becoming somewhat anxious for the credit of his house, he returned to the first with a proposal which he felt confident that no manufacturer who had an eye to his own interest would reject, to be at last frankly told: "Mr. ———, I must tell you that if I had any use for sarsaparilla I would take the lot you offer, but there is no maker of syrup in the country who ever uses a stick of it!"

A device frequently resorted to is that of obtaining a certificate from some chemist, to the effect that he has found nothing harmful or injurious in a certain compound, a certificate which may the more readily be given as it says nothing whatever of any examination or analysis. In some few instances the chemist goes a little further and declares that he has found no mercury, or that some other specified metal is not present, and in very rare cases a certificate that he has made a thorough examination, and found nothing harmful or injurious, will be given. Now, there are very few things concerning which general ideas are more hazy or confused than they are regarding chemical analysis; some persons look upon it as a process of almost magical

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powers, the application of which to any substance or compound must result in revealing its composition with unerring certainty, while others suppose that it includes far more than really belongs to it, and more than any chemist, as such, ever thinks of doing. The facts are that there are certain elementary and other substances which the chemist to-day can detect, even in the most minute quantities, with absolute certainty, and with hardly the remotest possibility of mistake; among these substances are the metals, carbon, phosphorus, sulphur, iodine, chlorine, bromine, and similar bodies, many organic compounds, especially such as are poisonous, and therefore liable to be used for criminal purposes, together with certain other classes of matter which, from one cause or another, have been carefully studied. But there remains an immense number of substances concerning which the chemist can give no account so far as their effects upon the human system is concerned, and which he can only submit to ultimate analysis; thus oil of turpentine, the properties of which differ very widely from oil of lemons, is identical with the latter, so far as chemical analysis can show, nor can the chemist assign any reason whatever for the different effects of these two bodies on the human or animal economy; there is, moreover, a large class of substances of the same type as the two just mentioned, substances which chemical analysis shows have an identical composition but which differ widely from each other in other respects, some being among our valued medicines and others ranking among virulent poisons.

Again Strychnia and Morphia when subjected to ultimate analysis give as their constituents Carbon, Hydrogen, Nitrogen and Oxygen, in slightly varying proportions, but such an examination throws no light upon their widely different physiological effects, and if we were compelled, as happily we are not, to depend upon it for the detection of one or the other of these drugs, in cases where either one

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has been employed criminally or suicidally, we should, in very many instances, be unable to decide between them. In the case of these two there are other methods of analysis, which render the detection of either one of them almost a certainty in experienced hands, but we are absolutely without knowledge at present, why two substances that resemble each other so closely in their composition, should produce such widely different and strongly marked effects. Thus it will be seen that chemical analysis has its limits, and that a certificate that such an examination has been made with the result of finding nothing prejudicial, may be very far from having any value; it may indeed easily happen than an analysis may be so conducted as to destroy injurious or noxious ingredients of organic origin altogether. It has been charged that some chemists have given certificates of the harmless character of certain nostrums without examination upon the payment of a heavy fee, and one writer has even asserted that he was the witness of such an occurrence; that in his presence a chemist gave a certificate, which the writer in question afterward saw printed, stating that a certain widely advertised compound, contained nothing harmful or injurions in any way, while the only knowledge which that chemist possessed of the composition of the stuff, was derived from the statement of its maker and vender, and from an examination which consisted simply of drawing the cork from a vial, and smelling at the contents thereof! It is sincerely to be hoped that chemists who would thus degrade a noble calling are few in number.

Although chemistry is thus powerless along certain lines, and in some directions, however, in other ways it is potent and its methods are daily being improved and its scope extended. What is called proximate analysis, which has for its object the separation of organic compounds into their immediate components, has already reached a high degree of perfection and is making rapid advances, so that we are

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now able to perform much good work, which a few years ago would have been pronounced impracticable. Many nostrums have been subjected to examination in this way, as has already been mentioned, with results which, could they be generally known, would render their sale almost impossible, at least to people of ordinary intelligence. In a French paper some time since there appeared a report of the trial of a certain self-styled doctor on a charge of swindling; his offense was the sale of a nostrum which he called "Eau Anti-Neuralgique" (Anti-neuralgic water), and for which he claimed that it was not only a potent cure for Neuralgia, but would prevent Epilepsy and act as a prophylactic against Apoplexy as well. According to the official report of the chemist who examined this wonderful compound it consisted of inferior brandy in which tobacco, previously treated with boiling water, had been soaked, the whole being colored with a little sulphate of indigo; this atrocious stuff was sold at five francs per bottle, and the accused party did not venture to deny the correctness of the analyst's report. Similar revelations have been made on this side of the Atlantic, though none probably quite so bad as the above. Professor Prescott, of the Michigan State University, says that certain "specifics for Rheumatism," analyzed in the laboratory of that institution, contained in one instance red pepper, liquorice and sugar; in another alum, common salt and water colored by cochineal. "One of them claimed to be charged with electricity in combination with essential oils! Oil of origanum and oil of tar were found, but the electricity must have evaporated before reaching the analyst."

Prof. Prescott gives yet other instances quite as bad as those just quoted.* "In a German report of the analyses of

* It is only right to say here that the quotations above and subsequently given are not literally exact, although it is believed that their sense is in no wise altered.

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articles sold as cures for Epilepsy, it was stated that one of these was a red-colored spirit of camphor; another was a powder of roasted acorns; another closely related to the large and increasing pad family of this country, was an amulet of certain seeds quilted in cotton to wear around the neck. Four of these articles — steadily sold for years under the same name and with the same declarations — had undergone many changes of composition during the time; one in particular had been changed three times, the only constant constituent being the volatile oil of cajeput by which it was scented; at one time it contained magnesia; muriate of ammonia remained through two changes, and for a long time it retained powdered valerian root." Such changes are not uncommon in American nosturms; there is one notorious class of preparations of which the composition has been altered as often as an analysis of it has been published, the name being almost the only thing about it that has remained unchanged. It is, however, "*the name that people are to buy and pay for*, and swallow when deadly disease stares them in the face."†

Returning to the exposures that have been made of the character of nostrums, we find it recorded that pain curers, warranted to relieve pain of any kind, external and internal, which, to quote from an advertisement of one of them published some time ago, but having its counterpart in many newspapers to-day, are guaranteed to cure "Rheumatism, Backache, Gout, Swellings of all kinds, Sciatica, Sore Throat, Lumbago, Sprains, Burns, Scalds, Toothache, Earache, Headache, Frosted Feet and all bodily pains generally," consist for the most part of turpentine, which is a very common ingredient, alcohol, which is also frequently used,

†Since the above was written, it has been the fortune of the writer to hear this plainly avowed by the render of a worthless nostrum. This man was asked why he did not patent his stuff, and replied that he "couldn't patent a name, and *the name was all that he cared for.*"

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ether, glycerine, ammonia, various petroleum products, kerosene being often one, camphor, pepper, with various essential oils, as peppermint, sassafras, juniper, etc., all of which are added to disguise the odor of the other more abundant constituents. Very many, if not all of these, bear on their labels the proper dose to be taken when they are used internally; who, not being an idiot or insane, would think of swallowing a mixture of kerosene and ammonia with a few drops of some essential oil added thereto for the relief of an earache or an attack of Neuralgia? Yet the writer has known of just such a compound being sold, and in all probability used for such purpose by its purchasers! Or who, suffering from pain of any kind, would resort to the closet and select ammonia, turpentine or strong alcohol or glycerine for its relief? Yet those who purchase King of Pain or any similar stuff and pour it into their stomachs do exactly that thing, without the advantage of knowing what quantity of any, or it may even be all of those substances they are taking, or what noxious additions may have been made thereto.

It matters not what the character of the nostrum may be, for what purpose it is thrust upon public attention the same principle of deceit runs through them all. Nerve tonics consist of morphine or opium; so-called sedatives have been found containing nothing but pure rice starch; helps to digestion are composed of refined saltpetre, while an elixir of life and lung balsam, so potent that caution must be used in not exceeding the prescribed dose, must have contained something so volatile that it escaped all the refined precautions of a modern chemical laboratory and left nothing but spring water behind it. These are comparatively venical deceptions, setting aside the fraud by which a cheap or worthless article is sold at a high price under the pretense that it is something costly and of great virtue, but there is another class for which condemnation cannot be too

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severe. Some few years ago the writer was visited by a poor fellow well-known in the town in which he lived who was the victim of a cancer of the lower jaw and whom the doctor in attendance, well knowing that all that remained to be done for his benefit was to relieve the pain under which he suffered and render his passage to the grave as easy as possible, had prescribed morphine. The man was poor and the medicine was costly, and in addition to these circumstances, his relatives were anything but intelligent, and had inspired him with a horror of the remedy and a grossly exaggerated idea of the evil effects consequent upon its use. Thus seeing the advertisement of an "opium cure" he had written to its proprietor and received a reply which confirmed him in the notions previously conceived, assured him that his case was entirely curable, and proposed to take him in hand for a certain sum named, payable in advance each month — all this, be it remembered, with no examination of the patient, and absolutely with no knowledge of the circumstances of his case, other than that obtainable from a single brief note written by a comparatively illiterate man! The patient had scraped together the sum demanded for the first month and forwarded it, receiving in return an eight-ounce vial filled with a transparent liquid of a delicate pink color, an odor which the man said "was quite familiar, though he couldn't name the stuff," and a taste peculiar to itself; a certain quantity of this preparation was to be taken daily at the hours at which the morphine had been previously taken, and certain cautions, unnecessary to quote here, were added to the directions given for its use. The effects produced, however, were so precisely similar in all respects to those of the morphine that the suspicions of the patient, who, though uneducated, was by no means lacking in shrewdness, were aroused. He brought the bottle to the writer and was soon in possession of the knowledge that he had purchased a solution of mor-

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phine with some coloring matter and a few drops of some essence, added for purposes of disguise, paying therefor five times the sum for which he could have bought the same thing at home. It is needless to add that the proposed treatment came to an end with the consumption of the single bottle; the unfortunate man lingered a few months longer, but the harpy who had expected to profit by his sufferings was happily disappointed.

Still worse than this, however, is a case recorded some years ago by a medical journal published in Michigan. "A highly colored liquid preparation has been sold all over the country under the name of an Antidote to the Opium Habit, at an enormous price, and with the promise that it will cure the habit of taking opium; it is declared by its venders to be free from opium or any preparation thereof. Mr. F. Reppert has subjected a sample of this magical liquid to analysis and finds it to contain meconic acid, narcotine, with traces of thebaine, codeine, etc., but no morphia.

Now, this appears to be the climax of shrewd economies; *selling off the worthless residue from the manufacture of morphine at a price far better than that of the original opium, to cure the victims of the latter!* Let the next man distil wine and sell the residue to neutralize the appetite for brandy."

"To every deep, still lower deeps succeed,"

but surely we have touched the bottom of all possible rascalities in this direction, and may turn our thoughts another way.

It has probably been made plain that anyone who ventures on using nostrums does so at his own risk, and in perfect ignorance of what he is taking; indeed in this fact lies the chief means by which they are sold. "No one would swallow any of them if he knew their composition, but in the uncertainty of the unknown, in the imaginary possibil-

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ities of the hidden, the fancy of the poor and well-nigh desperate victim of an obstinate malady clings to the specious promise of the craftily worded advertisement as to the very spectre of a chance for recovery. Just as men driven to straits will put their last pittance into the lottery, or as harassed persons will, in critical times, turn to the fortune-teller, so the sick man tries one game of chance among the unknown remedies, and tries again, and one more, and yet another," and the maker of the nostrum knows this weakness well, and counts upon it for his success.

No small amount of ingenuity is exhibited, moreover, in the advertisements themselves and in the means employed to inspire their readers with confidence. Passing over such brazen mendacity as that exhibited in certain publications much used by the peripatetic fraternity, who assure the public that by the use of a pair of magnetic spectacles "the stomach and digestion and all the muscles of the throat and lungs may be benefited, and "if you don't believe it you give proof of your own ignorance," there are announcements plausibly written and seeming to give the evidence of great physicians to the merits of the thing advertised. A little investigation shows one of two methods of deceit; either the pretended recommendation proves on examination to be some quotation from a famous medical writer, made simply for the purpose of using his name, having no bearing on the so-called remedy and assuredly having not the slightest reference thereto, or the name of the physician from whom quotation is ostensibly made, is somewhat altered by the change or omission of some initial letter, or by some orthography — cacography rather, which, while giving the sound correctly, enables the advertiser to creep out of the hole thus purposely left in the remote event of his being called to account — something which he trusts will never happen through the reluctance of the distinguished man

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whose name he thus abuses to dabble in dirt of a very dirty description.

The question of what can be done to put some check upon the great evil just discussed is a perplexing one; to a growing intelligence on the part of the general public, to education by those competent and willing to give it, it may be that we must look for any marked improvement, and progress by these paths, while certain and abiding, is very slow. There are some few members of the press in the United States into whose columns no advertisement of any nostrum whatever can find admission, and who have done good service in exposing the character of very many widely sold preparations; but such enormous sums are annually expended in advertising nostrums generally, and so large a proportion of the revenues of newspaper publishers is drawn therefrom, that it would be expecting human nature generally to rise to a far greater moral elevation than it has yet attained as a whole, to expect the whole body of the press, or even any considerable proportion thereof, to turn about and denounce the source of so important a part of its income. Some attempts have been made by various governments to suppress the sale of nostrums of which the composition is kept a secret, and in France, especially, as already incidentally mentioned, under some circumstances their proprietors are liable to conviction and punishment as swindlers. Generally, however, the means adopted have been by taxes and heavy licenses, and the proprietors and vendors have turned these to good account by announcing that their wares are sold under governmental guarantee, as evidenced by the stamps affixed to the boxes, bottles or other packages containing them. Other measures must clearly be employed by legislators if any good results are looked for from legal means, and the most practical as yet suggested seem to be those recommended by Prof. Prescott, in the paper from which much has already been drawn for this article and which are briefly

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these: compel every person who puts a nostrum into the market to put a statement of the constituents and their proportions upon the label; discourage by every possible means the universal practice of placing the names of *diseases* upon such labels; oblige the makers to put their true names and addresses instead of fictitious ones on their goods.

Thus much the law can and should do; in other matters it does all these already; it allows no article of food to be sold for anything other than it really is; why should medicines be an exception to the rule? Poisons may not be sold except they are properly labeled with their own names, and in some countries with a statement of the antidote; but many nostrums contain virulent poisons — substances which no one would think of taking if he knew it — *e. g.*, arsenic in ague-cures, corrosive sublimate in so-called sarsaparillas, turpentine and chloroform in pain-killers, and many other similar instances which might be named; why should these be exempted from a salutary rule?

With regard to a certain class of articles sold as panaceas nothing will avail but a higher or rather a different education in some respects, than anything as yet generally given in our schools; a more general instruction in Physiology must be the rule, if people are ever to cease believing that a belt or a pad covering any part of the skin can have any effect upon the organs underneath, or that a few strips of metal riveted or otherwise fastened together will produce an electrical current capable of working miracles of cure, when hung around the neck after the fashion of an amulet or twisted about the limbs or body like a savage's ornament, or that the use of a hair-brush into some part of which a magnetized needle has been driven, will avail to cure Neuralgia or Rheumatism.

It may be said that the prescriptions written by every physician are composed of ingredients which are wholly unknown to the patient, but this is true only to a very

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Nostrums.

limited extent; almost every one now-a-days who can read manuscript knows enough to decipher any ordinary prescription, and even if this be not the case, neither physicians or druggists are much disposed to keep up the traditions of former generations which wrapped medicine in mystery, and there are probably few of either who would not under any ordinary circumstances, or unless it was needful to keep a patient in ignorance for his own good, frankly tell him what medicine he was to take.

At any rate, all preparations which are sold for general public use should be compelled to make known their composition, because as matters now stand "it is very clear that to a so-called patent* medicine proprietor, the ingredients and their proportions are very little, either in cost or consequence as compared with name and notoriety."

The whole matter as against nostrums and their use, is summed up by Prof. Prescott so well that nothing better can be done, than to present in conclusion his reasoning, which is here done with the full conviction that it is not only cogent but entirely unanswerable.

"The use of patent medicines without a knowledge of their composition does injury to the health of the people.

1. Because they may, and, in fact, sometimes do, contain powerful or poisonous drugs unsuspected.

2. Because they always may be, and often are, inert and become a false reliance to the neglect of other and due measures in the care of health.

3. Because they are liable to be changed in composition (at the will of their makers) so that any experience of their effects, as they are purchased at one time, is not conclusive evidence as to the effects of the same named articles purchased at another time.

* None of these preparations are really patented; the very word patent, i. e., open, conspicuous, is contradicted by the fact that no one but the makers of the nostrums knows anything about their constituents.

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Nostrums.

4. Because the use of them is simply submitting the treatment of disease to a distant and irresponsible stranger, and is hazarding health in an apparent game of chance.

5. Because they are trusted to act as antidotes to disease in a sense in which no medicines can act as antidotes.

6. Because they favor excessive [and needless] recourse to medication, and thereby increase the resort to physicians, and intensify the demand that physicians shall give medicine, whether needed or not.

7. Because their analysis shows the greater part of them to be tainted with multiplied falsehood, and the patronage of falsehood is, and must be, demoralizing and dangerous, both to body and mind," and,

8. Because there is not a single one that is not sold under false pretences, none of them being able to do more than a very small portion of what is claimed for it, while in very many cases they are wholly incompetent to produce any good effect, whatever.

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THE INFLUENCE OF UNSANITARY SURROUNDINGS AND HABITS.

Report of a malignant outbreak of disease occurring at Chelsea, Wisconsin, showing the influence of unsanitary surroundings and habits.

BY. S. B. HUBBELL, M. D., OF MEDFORD.

[NOTE: — The following paper was received by the Secretary in the ordinary course of correspondence, but was deemed by the Board of such interest that its publication entire, was ordered.]

The past year has been one of unusual sickness and fatality in Taylor county: Measles, hitherto unknown, swept through most of our towns and villages, attacking almost every child. The disease was mild in character, with very few, if any, sequelæ, when unaccompanied or followed by Scarlet Fever. This latter disease appeared in several of our towns and villages, but by closing the schools and maintaining a strict quarantine of the affected persons, it was confined to a very few families. The cases that did occur were mild in character, but very fatal in the renal dropsies which followed in a large number of instances noted. It was difficult to make even the most intelligent class of our citizens believe, that private funerals, and strict isolation of the sick, were necessary to protect the well against infection, and more difficult still, to impress upon them the danger of kidney inflammation, and dropsy which so frequently follows this terrible disease.

Aside from these two contagious forms of disease, we have had nothing of general import except an outbreak of Typhoid Pneumonia, which appeared in August last at Chelsea, a small village on the line of the Central Railroad,

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seventy-two miles north of Stevens Point. The first person attacked was in the family of a German emigrant, and his case was followed by thirty-six more in the same locality.

Whole number sick	37
Died	21
Adult sick	20
Children from 4 to 6 years	17

The disease in every case began with a slight hacking cough, accompanied by moderate fever, pain in chest, loss of appetite and general weakness. A few days developed inflammation in one or more lobes of lung tissue, but often only a very circumscribed point of such inflammation could be detected. At the end of ten to fourteen days the stools — which in the majority of cases had been constipated — suddenly assumed a loose and purging character, accompanied with tenderness in groins and gaseous distention of abdomen. In a few of the cases blood was noticed more or less frequently in the alvine discharges. The fatal cases gradually grew weaker, passed into delirium, unconsciousness and death. The recoveries were protracted and tedious, the patients for a long time seeming to be utterly without energy and vital force to wean them back to convalescence and health. So large a number of cases in one locality, with so great mortality, presupposes a local cause of a most virulent nature. The reason for this outbreak of disease is so apparent and its remedy so palpable, that a statement of the facts will be most interesting.

The village of Chelsea consists of a hundred or more houses, situated within a radius of one thousand feet of the depot; and yet notwithstanding the nearness of all the dwellings to each other, the disease was confined to a group of houses in the southeast portion of the village, contained in a square of ground with a distance across of not more than three hundred feet, and bounded on three sides by a

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road, raised somewhat above the level of the square. The buildings are most of them small, one-story houses, facing the three roads, leaving a hollow square of two hundred feet within the circle, in which are located all the outhouses, stables and wells used by the denizens of these tenements. These rows have been occupied for the past six years, and the offal and garbage and filth had been allowed to accumulate about and under them without any attempt having been made to get rid of it. Owing to the elevation of the road on three sides, and a rise of ground upon the fourth, there was no way that the refuse from house and barn and privy vault could escape, and so we had a most apparent predisposing cause for this outbreak. The exciting cause of the disease lay in the fact that, during the month of August some ten families of German emigrants were added to the occupants of this square. Twenty-eight of these people crowded into a small house, and of this number thirteen died of the disease, which broke out a few weeks after their arrival. About two weeks before the first case of sickness occurred, a well was dug a distance of sixty feet from this house and thirty feet from the nearest privy. The local sanitary inspector states "that the entire ground between these houses was devoted to the uses peculiar to a privy," so the distance from the well to adjacent buildings is of little import. An examination of the water did not show any unhealthy matter present,* but that this outbreak of disease was due to long accumulated filth, defective sewerage, over-

*NOTE. An inquiry concerning the nature of the examination made of this water brought the following reply from Dr. Hubbell:

There was nothing in the taste or smell of the water to indicate filth. I brought a sample home and applied Heisch's test, but could discover no change that would indicate presence of an unhealthy organic matter. However, the persons who did not use the water were not attacked by the disease. So I had the well closed up and other water used both by sick and well. All cases began to improve at once. I have no doubt but that the water was contaminated.

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crowding and utter neglect of hygienic laws or even ordinary rules of health, admits of no doubt for the following reasons: This disease appeared nowhere else in the village except in the square of houses described. It was not contagious and could not have been imported, and the only people who escaped the fatal consequences of the disease, were a few families who were clean and neat about their premises, and careful to avoid all unnecessary exposure to unsanitary provoking causes. As a matter of treatment, it may be said in conclusion that the cases that recovered were in families where cleanliness and decency were the rule, and where the patients were provided with wholesome food and light and air.

The above history strikingly illustrates the importance of public health boards, and the necessity for the more stringent enforcement of our sanitary laws, which, through the forgetfulness or neglect of local officers, are so little regarded until sickness, misery and death awakens them to their duty.

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VARIOUS OBSERVATIONS ON GROWTH.

BY GEO. W. PECKHAM, M. D., OF MILWAUKEE.

[NOTE: — The following tables, are in continuation of the studies commenced some time ago by Prof. Peckham, on "The Growth of Children," the first results of which were published in the last Report of this Board and which are to be further continued hereafter.]

The observations in Table No. I were obtained through the courtesy of Prof. H. M. Whitney; the subjects being students in attendance on Beloit College. Beloit is a town of about 5000 inhabitants, situated on the southern border of Wisconsin, near the center.

TABLE NO. I. — *Showing Average Heights Without Shoes, in Inches, of Students at Beloit College, Irrespective of Nationality:*

Age at last birthday.	No. of Observations.	Inches.
14	10	63.34
15	19	65.13
16	40	66.04
17	53	66.55
18	59	67.88
19	69	68.11
20	90	68.54
21	89	68.77
22	52	68.67
23	29	68.96
24	18	69.30
25	11	69.71

(Tables Nos. II and III show average heights and weights of children one, two and three years old.)

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Various Observations on Growth.

TABLE No. II.—*Showing Average Heights Without Shoes of Boys and Girls, one, two and three years old.*

Age at last birthday.	Boys.						Girls.					
	Irrespective of Nationality.		Americans.		Germans.		Irrespective of Nationality.		Americans.		Germans.	
	Number of Obs.	Inches.	Number of Obs.	Inches.	Number of Obs.	Inches.	Number of Obs.	Inches.	Number of Obs.	Inches.	Number of Obs.	Inches.
1.....	25	29.53	13	28.71	7	30.71	36	29.67	15	29.71	10	28.83
2.....	38	33.82	12	34.56	12	32.88	33	32.94	8	33.93	9	32.24
3.....	32	37.06	11	37.85	9	37.01	52	36.31	19	36.98	12	36.09

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TABLE No. III.— *Showing Average Weights of Boys and Girls one, two and three years old.*

Age at last birthday.	Boys.						Girls.					
	Irrespective of Nationality.		Americans.		Germans.		Irrespective of Nationality.		Americans.		Germans.	
	Number of Obs.	Pounds.	Number of Obs.	Pounds.	Number of Obs.	Pounds.	Number of Obs.	Pounds.	Number of Obs.	Pounds.	Number of Obs.	Pounds.
1.....	31	24.39	15	23.18	8	27.59	37	23.11	12	21.94	11	22.68
2.....	42	30.38	12	32.33	12	30.04	35	29.30	10	30.23	9	26.61
3.....	34	35	11	36.18	9	36	49	33.17	20	35.40	12	32.54

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Various Observations on Growth.

Table No. IV shows the growth from year to year of children in the same family. It is interesting to note the difference in their heights at similar ages.

TABLE No. 4, showing actual increase in heights from year to year of seven brothers and sisters. Children born in the United States. Parents and Grand-Parents English.

AGE.	HEIGHTS IN INCHES AND TENTHS.						
	GIRLS.					BOYS.	
	A.	B.	C.	D.	E.	F.	G.
2	29.1	.....	.....	.....	.....	.....	.....
3	.....	.....	.....	.....	.....	.....	.....
4	38.3	40	.....	.....	32.7	.....	.....
5	40.9	41.5	.....	.....	35.6	.....	.....
6	42.5	44.4	.....	.....	38.1	46.3	.....
7	44.3	46.4	.....	.....	39.7	48	.....
8	46.5	48.3	47.7	.....	42.3	50	.....
9	48.2	50	49.3	.....	44.2	51.8	.....
10	49.9	52	51.2	.....	46	53.5	.....
11	52.4	53.2	53.3	.....	48	54.7	.....
12	53.9	55.1	56	55.9	49.3	56.1	.....
13	56.2	56.1	58.5	56.5	51.7	58	.....
14	58.4	58.5	60.4	59.1	52.7	59.3	57.9
15	61	60.7	61.2	61.6	54.7	62.5	59.4
16	61.9	62	61.3	63.5	57.1	66.1	62.5
17	62.6	62.5	61.3	63.8	59.9	68.9	65.7
18	63	63.5	61.5	63.8	.....	69.9	66.8
19	63.5	63.5	.....	63.8	.....	70.9	66.8

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A Simple Earth Closet.

A SIMPLE EARTH CLOSET.

BY PROF. W. A. HENRY, STATE UNIVERSITY, MADISON, WIS.

While mankind has of late attained rapidly to the comforts that increasing knowledge brings, progression has been far from symmetrical. As an example of this let the reader reflect for a moment upon the almost universal method adopted for the disposal of human excrement. He who desires to show how wretchedly imperfect is our present civilization, need do no more than point to the common "privy." True, the water closet is now about all that can be desired, but its use is at present limited mostly to cities where there is an abundant supply of water. Comparatively, this system is the exception and not the rule. Outside the city go where you will, the ever present outbuilding meets the eye at each point in the landscape. In location it is too near the house by its odors, and too far for comfort.

However, I did not start out to find fault but to tell of what had been done in one instance to improve upon the common plan. It occurred to me, upon going on a farm to live not long since, and finding there the usual objectionable out-building, that there might be some simple way of remedying the present conditions without any radical change. To put in a water closet was out of the question, so nothing was left but to try the Dry Earth System. I was aware that there were several patented arrangements for this purpose, but preferred something simpler, and the purpose of this paper is to tell just what was done and how.

The privy as I found it was like most others in size and shape and the first thing necessary was to elevate it suffi-

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ciently to slide a box under the seat to hold the droppings and dry earth. The building was elevated two feet and placed on a good brick foundation, the wall running only on the two sides and front. At the back part it was left entirely open. The old vault was filled up with fresh earth, all odors being thus destroyed. Next a strong, tight box of 2-inch pine plank was made. The sides were twenty inches high and the bottom sixteen inches wide. It was twenty inches wide at the top, which was left open. This box was placed on two runners about five feet long, made of scantling. These runners projected about three feet in front of the box, and, at the extremities of the runners and above, a cross-piece was bolted, to which, by means of doubletrees, a team would be attached. The whole, when completed, resembled, somewhat, a very wide, short sleigh, on low runners. Under the privy two planks were placed to support the runners when the box was slid in so as to be directly under the seat. When thus shoved under, the box completely closed the opening at the back of the building.

The next step was to prepare a receptacle for dry earth. This was acomplished by making a box inside the privy long enough to hold several bushels of earth and placing it in a corner against the wall so as to be filled through a small door cut through the side of the building. The bottom of the box was placed more than a foot above the floor and was provided below with a spout through which the dry earth could run into a low box. A common dipper to handle the earth with, completed the arrangements.

At first dry earth, taken from the road during dry weather, served an excellent purpose. At present the earth is prepared by spreading fresh soil over boards, laid on the ground in the wagon shed, a couple of months before being needed.

Experience has shown that a small dipper full of earth after each sitting, is amply sufficient to keep down all odors.

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A Simple Earth Closet.

When the box becomes full a team is hitched to the cross-piece before described, and it is drawn to the field where it is dumped by unhooking the team and two men lifting at the runners.

It will be seen that this method of disposal is simple and inexpensive In the whole process one does not encounter as much odor as in remaining in the ordinary privy five minutes. It is pre-eminently practical on the farm, as any privy can be so located as to be approached by a team from the rear. The box to be placed below the seat can be made by any farmer boy having ordinary skillfulness in the use of the saw and hammer. Instead of the box for holding the dry earth, as I have described, a barrel might be used. The dry earth should be fine and free as possible from sticks and stones if it is to run well through the spout into the box described. The amount of earth necessary for the purpose is far less than one would suppose who had not tried this system. Of course to succeed some one must have an oversight of the affair, and a little daily attention is needed, as there are always careless persons about, whose habits are not at all creditable, but the attention required is usually quite small. It is not my purpose here to discuss the dangers arising from the proximity of privy vaults to wells, or of the valuable fertilizing material usually wasted. The advantages of the system in these regards is most evident.

I believe that with a good wind-mill upon the farm the water-closet is practicable, but if we are to wait for this, in most cases improvement will be slow indeed. The plan I offer is applicable to all cases and at a slight expense.

A word or two more and I have finished. There should always be two privies on the farm. One should be located at the barn and convenient for those working there morning and evening. The best location for that designed for

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A Simple Earth Closet.

house use that I know of is in the woodshed, which should be attached to the house. By so placing it, it is accessible at all times without that exposure now so universally forced upon all the household members.

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EXTRACTS FROM SPECIAL CORRESPONDENCE.

Our correspondence for this year is remarkably copious and full of interest. From it has been drawn the material for the history of Small Pox, which appears elsewhere in this volume, in connection with which the names of the gentlemen contributing are printed, and much other matter that has been of value in the prosecution of the work of the board, and in the preparation of this report. Besides these, there was much of public interest which could hardly find a place either in the body of the report proper, or in the history of specific disease, but which nevertheless contained so many valuable lessons of the most practical kind as to render publication eminently desirable. These items have accordingly been excerpted and are presented in the pages that follow. The various extracts are arranged alphabetically according to the localities from which they come, the name of the correspondent being given in connection with each, excepting in a few instances where it was requested that this should not be done.

It will of course be understood that these extracts, and those from letters received from clerks of local boards of health which follow, are here presented, as expressing the belief and opinions of the writers upon the subjects discussed, and that the board is not to be held responsible for the correctness of any of the statements herein made, the object being to give substantially in their own language, the views of our correspondents upon these subjects of personal and public interest.

From ASHLAND; *Dr. E. Ellis*:— Our town has no sewerage, and all the waste water, slops, etc., of every kind remains where it is thrown on the surface, the ground not having

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slope enough to carry it off into the bay. The bay furnishes us with drinking water, and all along the bay-shore there are large quantities of decaying saw-dust from the mills; it is true that the water of the bay is constantly agitated by the winds, and it is probable that the changes of water caused by the currents so produced, are our chief safeguard.

I am hardly willing to say that I have observed any constant unsanitary condition as having been present where Diphtheria has prevailed; the worst case I ever saw, however — which terminated fatally — followed the opening of drains connected with the privy of a large hotel. The family lived in the hotel and the privy and drains gave off a very offensive odor.

Diphtheria has not prevailed hereabouts to any extent during the past year, nor has its type been very severe.

From AUGUSTA; *Dr. D. C. Spencer:*— Over-crowded apartments, together with bad water, I think, had much to do with the origin and spread of Diphtheria here. It spread epidemically last spring, and the mortality was fifty per cent. Two thirds of the cases were malignant in type.

From BEAR CREEK; *Dr. J. Finney.* Diphtheria has prevailed to a very considerable extent in my practice, many cases comparatively being malignant. The sanitary conditions were bad in all my cases; the croupal variety of the disease occurred frequently in wet or damp localities, and in poorly ventilated houses; the malignant instances were on sandy soils, with adjacent defective privies; in many places I think the well water was affected by leaching of the contents of the privy vault through the sand. I am disposed to consider filth as an exciting cause. The better classes hereabouts are coming to the same opinion, and are more cautious than formerly about their sanitation. Repeated severe lessons, dearly paid for, the constant admonitions of physicians and sanitarians as to isolation, dispensing with public fune-

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rals in case of death from this disease, are at last having some effect.

From BERLIN; *Drs. N. M. Dodson and C. M. Willis.* Diphtheria has not prevailed to any very great extent, and its type has been milder than it was last year. The most constant and important unsanitary condition has been wet cellars; the neighborhood of low and marshy land has evidently favored the spread of the disease, but wet cellars, crowded houses and filth have been the most important factors; where these have been we have found the worst types of the disease. The virulence of the original cause, whatever that may be, has diminished apparently, to a certain extent; but increased care and cleanliness, with greater attention to quarantine, have also done their part in rendering the disease less fatal and preventing its spread.

Measles and Whooping Cough, both of severe type, have prevailed extensively, indeed the latter is still prevalent very severely for the season, and while no deaths have occurred from either uncomplicated, both have determined fatal results in connection with pulmonary disorders.

From BLACK RIVER FALLS; *Dr. H. B. Cole.* The one case of Diphtheria that I have seen during the year was in a locality that must have been affected by drainage from a barn-yard, and other cases that have occurred in this locality were apparently traceable to bad drainage and bad water. Yet I have not had sufficient experience to say positively that these had an injurious effect. There has been less Diphtheria here and in the surrounding country than for a few years past, but I do not know that there has been any great change in the drainage or in local hygiene.

From BLOOMER ; *Dr. R. Cottington.* We have had Diphtheria in a very severe epidemic form during the year, and the type in many cases has been malignant; the death-rate was at least twenty-five per cent. I cannot say that I observed much difference in the sanitary condition of the

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various places where the disease prevailed; one place appeared about as subject to it as another. I must say, however, that bad sanitary surroundings added very materialiy to the *malignancy* of the attacks. I should estimate that three-fourths of the children of this town had at least one attack during the past twelve months, and among certain classes of the foreign residents who lived in poorly ventilated houses, and under very unfavorable hygienic conditions there certainly was a marked increase in the death-rate. I confess my inability to account for the out-break in the first instance, and I with many others am looking anxiously to the leaders in the medical world in the hope that they will yet be able to furnish us with some weapon which we can use with effect in the battle with this pestilence which is desolating so many homes.

[The weapons which have proven most effective as against the spread of this disease wherever it has unfortunately obtained an entrance, are at the hand of any one who will use them; but it rests chiefly with the friends and neighbors of the sick whether these weapons shall be employed or neglected. Careful and complete isolation of the patient, the prompt destruction of all discharges from the body, and the thorough disinfection of clothing and other articles used in the sick room, whenever faithfully employed, have prevented Diphtheria from becoming epidemic. It is true that we have no such method of rendering the system invulnerable to its attacks, as vaccination gives us in the case of Small Pox, but it is the height of folly not to avail ourselves of such means, as we have for protection for no better reason than that medical science has as yet furnished no perfect antidote.]

From BOSCOBEL; *Dr. L. G. Armstrong.* Wet cellars and soil saturation, and want of proper ventilation of living rooms and cellars are in the best of my judgment factors which have an influence upon the *character* of Diphtheria.

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From BRILLION; *Dr. I. N. McComb.* Diphtheria has not been so prevalent hereabouts as during the two preceding years; the cases I have seen have been of the croupal form. I do not think that the saturation of the soil, or wet cellars, have so much influence in the disease as the unsanitary condition of many of the houses, especially with regard to their ventilation and general uncleanliness.

From BRISTOL; *Dr. L. D. Scherer:*—Several cases of Typhoid have had their origin in poorly ventilated cellars, in the use of water from superficial sources, and in drinking from wells located in the barn-yards.

From BRODHEAD; *Dr. R. Broughton:*—Cases of Diphtheria have not been very many; I have seen but seventeen in all, ten of which, with six deaths, were in one family. Filth was a cause.

From CAMBRIA; *Dr. J. L. Williams:*—Twenty-five years ago we were troubled here by a malignant Dysentery every autumn. At that time almost all the inhabitants used water from the creeks carried in barrels, and usually enough at one time to last for three or four days; as settlers began to dig wells, and to use water drawn from them instead of surface water, the disease began to grow less frequent, and now that every one uses well water we have no cases of Dysentery. The same thing has held good for Remittent Fever which used to be very common, and in a measure with Intermittents also; all ceased with the change of water. I have had one family with Typho-Malarial Fever, one death before I visited them and seven others sick. The house was too small, but the well was sunk bordering on the cattle-yard, where I think foul water might get in.

From CAMBRIDGE; *Dr. L. W. Clarke.*—For seven months ending with May, 1882, there has been much more sickness in this vicinity than is usual. Measles, followed by pulmonary congestion and influenza, have been the prevailing

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troubles; the latter seemed due to some atmospheric influence, which, of course, was beyond the physician's control; the best regulated houses seemed as much subject to invasion as those where there was no sanitary regulation at all. There was quite a large percentage of deaths. In answer to your question on the communication of disease by vaccination, I will say that I saw some of our soldiers who were vaccinated when prisoners in Texas who were affected with what I should judge to be Syphilis. I was in charge of an army Small Pox hospital, and hence was often exposed during the war. I never took the disease nor could I make re-vaccination work on myself; hence, I infer that a single vaccination is a protection for life so far as I am concerned, however it may be with others.

From CASCADE; *Dr. G. F. Loomis.*— Diphtheria has prevailed in this vicinity for three years past with a mortality of about twenty-five per cent; this year the cases have not been so many — not more than one-third of the number occurring in the two years preceding — but the death-rate has been about the same. This county has suffered terribly from it during the time above mentioned; I judge that there have been at least a thousand cases. In nearly or quite all the cases that have proven fatal in my practice, the sanitary surroundings were not good; the houses were small, the cellars damp and the rooms low. While I cannot assert that filth will generate the disease, I am positive that it assists in feeding and perhaps rendering the type more malignant. I attribute very many of my worst cases to the want of isolation; I may say that death was caused by direct contact, for many cases that were removed from the rest when the disease entered a family were saved.

Typhoid Fever has prevailed hereabout to an alarming extent during the year, and with a fatality long unknown. I have no doubt of its being contagious; I can give instances where it has been brought into a family from without with deadly

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results. The fall of 1881 was very wet, and surface drainage found its way into many wells, giving rise to the disease in many cases. An instructive instance was that of two men, carpenters, who were at work in an adjoining town, where they were compelled to drink from a small pond by the wayside during two weeks; both came down with Typhoid, severe and well marked, their families were attacked and several members of them died; the disease continued in their neighborhood for months. The sanitary conditions of many houses are very far from perfection, and should receive attention. Vaccination is sadly neglected here; not over two-thirds of the children are protected, although most of the adults can show good scars.

From CATO: *Dr. R. S. O'Connell.* We have had but little Diphtheria here, and what few cases have occurred have been mild in type. I have noticed very generally that where the disease has prevailed there has been a lack of cleanliness or damp cellar, or some other unsanitary condition. This is not invariably true, but sufficiently often so to attract attention. I think the decrease of the disorder largely due to greater care and attention to surroundings. About two-thirds of our people are vaccinated.

From CLEAR LAKE; *Dr. M. P. Goodwin:* — Diphtheria has long been prevalent and has assumed a malignant type in very many instances. The cause to a very great extent has been the entire lack of anything in the nature of sanitation; up to the present summer the town has been very foul; decaying vegetable matter and other filth could be seen everywhere, and little if any effort was put forth for the improvement of things. Now, however, a Board of Health has been organized and we hope for some systematic attempt to establish and maintain cleanliness and to check the spread of disease which has hitherto been wholly uncontrolled.

From CLINTON; *Dr. G. Covert:* — Being health officer of

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this town last winter I advised vaccination and re-vaccination, and my advice was very generally followed; probably about seventy-five per cent. of the population are now protected. During the last year there has been but little Diphtheria, and that of a mild type; the season was wet and cold, and in our village there have been more wet cellars than usual; hence I am compelled to infer that cold, wet weather and soil saturation are unfavorable to the development of the diphtheritic poison. But another reason may be found in the fact that more attention is now being paid to general hygiene and preventive medicine than ever before; we are making progress in that direction, although slowly.

I should add that in vaccinating I have not confined myself to either bovine or humanized virus. I prefer the humanized, however, if taken from a healthy child; I have never known it to fail in giving protection even seven days after exposure.

From COLBY; *Dr. H. Grivelly.* I have not been long enough in this county to answer your questions satisfactorily; so far as I know, Diphtheria prevailed here in a gangrenous form last winter. I know from my own experience that marshy lands, wet cellars, uncleanliness, decomposition of organic matters, over-crowded houses, miasma generally, all have a specifically bad influence on the character of the disease.

From COLFAX; *Dr. E. Monteith.* I think that bad drinking water and foul cellars have a decided bad influence upon Diphtheria. As an illustration, there are three families, A, B and C. A and C living about a mile apart, and B. midway between them; B has good spring-water to drink and keeps things neat and clean generally, and has never been troubled with Diphtheria. A and C have both bad drinking water and both have had severe attacks of the disease in their houses. I have had more adult patients during the last

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year than ever before. The Norwegians in many cases hereabout spread the disease largely; they are apt to trust too extensively to the preacher's rather than to the doctor's directions, and there are many among them who say that when their time comes they must die, and so will not call in a physician, no matter what the trouble may be.

From COLUMBUS; *Dr. D. C. Davies.* Filth, unwholesome food, and impure air, in my opinion, are factors of greater importance in determining the malignancy of Diphtheria than are damp surroundings and their congener, malaria; such has certainly been my experience. The disease has decreased perceptibly of late, but the why and wherefore are beyond my ken.

Last spring a German immigrant family brought a malignant type of Scarlatina into a neighborhood known as the Portland settlement, which disease was declared by an ignorant charlatan to be "Rotheln." As a consequence of this blunder, some ten families were victims to the poison of the malady before its ravages could be arrested, and five children and a young man of twenty-three died.

"Rotheln" was unknown in these parts prior to the winter or spring of '81, but since then has prevailed and traveled over the whole surrounding country. It doesn't amount to very much generally, its severity being in the majority of cases about equal to that of Chicken Pox.

From DARIEN; *Dr. A. J. Rodman.* I believe that a certain indefinite proportion of individuals are protected from Small Pox for life by a single successful vaccination, and that all are protected for a term of at least ten years; after the expiration of that time I would advise re-vaccination. I have used humanized virus for twenty-five years, and have found it much more certain than the bovine.

With regard to Diphtheria, I once had eight cases in one family, two malignant, which I attributed to water standing in the cellar; Diphtheria was not prevalent in the neigh-

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borhood at the time, and what seemed to make the case still stronger was the fact that the father of the family, who was away from home all day and slept in the upper story at night, was not affected at all. In May last I had a series of eleven cases of Diphtheria, all so directly traceable to one individual that the history is worth recording. I was called upon to see a lady who had come here upon a visit from Racine who was said to be sick, and whom I found to be suffering under pronounced Diphtheria. Two days afterwards this lady's hostess and her three children, together with a neighboring boy, who had called at the house, staying there not over ten minutes, and the visitor's husband, all was seized. From the boy his sister, who nursed him, and the physician in attendance on both, caught the disease, and soon afterwards a little brother of the visitor's was taken down and died. The boy who carried the malady home to his sister and to the doctor, also died, but all the others recovered, the doctor only after a severe sickness. All these cases were traced directly to the visitor's daughter who had had Diphtheria in Racine. Her mother, who nursed her took the disease directly from her; her father, the hostess and four children caught it from the second case; the older sister and the doctor took it from the visiting boy, and the last child contracted it from the second case. Seven of the ten came down two days after exposure.

From DELAFIELD; *Dr. S. B. Sperry.* On July 19, 1882, I was called to a case, which on my second visit I found to be Diphtheria of a very malignant type, and which was followed by others in rapid succession until four members of the family had been stricken down and died. The family occupied a large, airy house situated on a hill in a beautiful region of country; everything in the surroundings gave evidence of prosperity, and it was not until I had made a thorough examination of the premises that I discovered a condition of things that I am about to describe. In the

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middle of the house was a cistern, the water of which had a bad smell; the privy was but thirty feet distant from the well and the vault was filled with solid excrement up to the seat; the barn was sixty feet from the well, and the land sloped gradually from the former to the latter and the soil was sandy and porous. They had been advised by a physician formerly in attendance to dig a new well and they would have done wisely had they heeded the advice.

Six months before the same family had suffered from Pneumonia from which three had died, *i. e.* the mother and two elder daughters, and the family had always been a sickly one.

Now look at the sequence of events; first Pneumonia which carries off three victims; a sickly family generally left; six months afterward Diphtheria comes among them, the first attacked having probably contracted the disease by chewing gum which had been used by another child just recovered therefrom; then the father came down, then the oldest son, then the youngest, and lastly a child of four years old; they have the benefit of the best medical advice and counsel that can be obtained, but these four last named all die, seeming not to have any strength wherewith to resist the attacks of the disease; the first seized has a long seige of six weeks illness, and then slowly recovers; the water is discovered to be in the condition above described. Here are seven deaths in one house within six months there being strong ground for ascribing this appalling mortality to the use of excrementally polluted water.

From DE SOTO; *Dr. O. Ewers.* Diphtheria has prevailed over this section of country with considerable severity, generally affecting families whose surroundings have been unsanitary. In one family I found a foul cellar which I believe caused the disease; in another the children contracted the Diphtheria by attending school in an old school house where the disease had been six months before.

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From DOUGLAS CENTRE; *Dr. H. H. Parrott.* Diphtheria has been much less frequent and severe than in preceding years; while I have seen cases in high and apparently dry locations, I believe that the disease is greatly aggravated by damp and marshy situations.

From DURAND; *Dr. D. W. Hunt.* Diphtheria has prevailed hereabouts among the very poorest, and those who live in filthy and badly ventilated dwellings; it has sometime attacked a whole family under such circumstances, not another person in the neighborhood suffering; the dwellings in all such cases being poor and filthy. One man lost six children, and in another instance a father and three childdren died.

From EAGLE; *Dr. C. B. Bannister.* Diphtheria has been quite severe in limited areas in this vicinity, and my observation has been, that both it and Typhoid Fever are more malignant in low marshy localities and over damp cellars than in dry situations. It does not seem to me that the question of soil, wet or dry, ought to be a moot one any longer; stagnant water is death, and no man who has any regard for his life should live on a damp soil; drainage is a large factor in promoting a healthy condition of any place.

From ELROY; *Dr. C. E. Booth.* During the entire year I have seen only four cases of Diphtheria — one fatal. I had but little opportunity to investigate, and I know of no deleterious influences existing in any of these cases, but I believe that the unsanitary influences enumerated in your question all have a very disastrous effect upon this disease.

There is much vaccinating being done here, and much more ought to be done. There are many, and those of the class whose powers of resistance to the attacks of disease are, from various causes, at the lowest, and whose ability to care for the seriously sick is the poorest, who will neither subject themselves to vaccination or allow their children to be subjected thereto. These people should be reached, not

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only for their own sakes, but for the protection of their neighbors and the community at large, since they are a constant menace, which may at any moment be carried into action; I am well satisfied that this can only be done by compulsory measures; it is said that compulsion would excite a spirit of opposition; but in my judgment, such a spirit is already in action, and we are controlled by it, when we ought to meet it and firmly control it.

In relation to the general health of this section, we have been afflicted with much more sickness during the year past than for any other year of our history; no new forms of disease have developed, but there have been more cases and those of a more severe type. Malaria, which ten years ago was rife, has gradually disappeared, and Typhoid has taken its place, in most cases assuming a very severe character, and the same thing is true of disorders which commonly give the physician little uneasiness, and readily yield to treatment; they have taken on a stubborn resisting character, with a persistent tendency to relapse.

The cause of all this, I am persuaded, is two-fold: first, there is the loss of recuperative power sustained by many during the severe cold of the winter; and, second, the heavy and prolonged rains of the season just ended, which have rendered drinking water impure by introducing into wells, &c., much surface drainage; have filled cellars with water; saturated the soil, and in a variety of ways produced deleterious results.

From ETTRICK; *Dr. W. E. Parker.* Pneumonia has visited two sections of this township, but I cannot see that there has been any marked difference between the sanitary conditions of these sections and others where the disease has not appeared. It has generally been very insidious in its approaches, and where the threatened individual has been seen in good season, and the slight chilliness and general malaise which have formed the initial symptoms have been

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treated, it has several times been possible to prevent the more serious attack. Cerebro-Spinal Meningitis has prevailed sporadically, occurring in every instance but one, in cold, damp or over-crowded houses where hygienic surroundings are non-existent. The single exception was a case in which it followed upon an attack of Scarlet Fever, and this was the sole instance of recovery. There were seven cases in all, six proving fatal.

From EUREKA; *Dr. I. E. Loop.* Diphtheria has prevailed in both mild and malignant forms, but not to so great an extent as two years ago. Wet cellars and soil saturation have their influence, I think, upon the disease, but I have seen bad cases which I could not account for by reason of them.

I have seen some forms of skin disease follow upon vaccination which I supposed were originated thereby, and I have seen Erysipelas follow. I am not positive, however, that disease was communicated from the virus, though I supposed at the time that it might be.

From FORT ATKINSON; *Dr. G. C. Stockman.* We have had considerable Diphtheria in and about this city, and in most cases it has been unusually severe; in one home where two members of the family had it, a pig-pen was very offensive, and was thought by many to be the cause of the disease. Very many of the cellars are full of water during more than half the year.

There has been much complaint of bad water in the wells of our city of late; we have no health board, and I have been asked to examine the water, in which I find sulphuretted hydrogen and carbonic acid in great excess. We need both a health board and a health officer in our city, but no one is appointed, and the common council seem disinclined to take any action or precaution that may benefit the health of our people.

From FORT HOWARD; *Dr. W. H. Bartran.* During May

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and June last, Diphtheria broke out in four families in quite malignant form; two of these families lost one member each and one suffered the loss of two. They were among the best citizens of the place, and their surroundings were good and healthy. While I think that wet cellars and undrained foundations may be *a* cause of Diphtheria, I am unable to say that they are the specific cause. I do attribute the increase of the disease to dampness of soil and water standing under and around dwellings. We have no system of sewerage here, a lack that will in time prove dangerous to the health of our residents.

From FOUNTAIN. Cerebro-Spinal Meningitis has been quite prevalent and fatal here, attacking chiefly families who are rather filthy in their habits, and whose houses are damp and unventilated.

From FOUNTAIN CITY; *Dr. G. A. Bodenstab.* My observation of Diphtheria has shown me that wet cellars, marshy lands and excessive soil saturation have a special influence upon the prevalence and malignancy of the disease.

From FRANKFORT. Diphtheria has prevailed here chiefly in low-ceilinged, unventilated log-houses—places hardly fit for human beings to live in. In such habitations it has taken away two out of every four of the residents.

From FREDONIA; *Dr. J. H. Voje.* The severest cases of Diphtheria that I have ever seen have always been where sanitary conditions were unfavorable, especially in log-houses with wet and unventilated cellars, and located near marshy ground. It would be well if people in general could receive information, either through local newspapers or some other accsssible channel, where and how to sink wells, to locate necessary outbuildings and upon other matters of the same kind. If they could be taught to make their windows larger, and thus secure more light and air, it would be a good thing also.

I had some cases of Small Pox in a household consisting

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of husband and wife, five children and two hired men, none of whom had ever been vaccinated. When the man came down I vaccinated all the rest; the virus took in all the cases except that of a child four years old, and in her case the operation was repeated seven days later with success; two days after the second operation she was taken sick, but escaped with the disease in its mildest form. No one of the others was affected at all, though they were strictly confined to the house during the existence of the malady.

From FRIENDSHIP; *Dr. J. M. Harrison.* There has been no case of Small Pox in Adams county since 1873, when a young man brought the disease hither from the pineries; it was carefully isolated then, and did not spread beyond the house to which he went. In my judgment not more than one-fifth of the people here are *properly* protected by vaccination; scabs have been used which have produced scars which are a positive damage, as those who bear them think themselves protected when they are not. I have seen Scabies transmitted from one family to another by self-vaccination, undertaken to save expense.

I do not think that genuine Diphtheria has ever prevailed in this neighborhood as an epidemic, but I am decidedly of the opinion that the conditions enumerated in your circular letter would have a very special and bad influence on its character.

From GENEVA; *Dr. G. E. Catlin.* We have been almost wholly free from Diphtheria during the past year. While I do not think that the disease is *produced* by any surroundings or unsanitary conditions, I find that the poorly fed and poorly clad suffer most from it, and that the death rate is apt to be much heavier among patients of that class.

From GEORGETOWN; *Dr. J. Oettiker.* There have been many cases of Typhoid within the last few weeks, all thus far on the bottom lands; they seem to be so closely associated with the mists and fogs that hang over the creeks and

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along the bottoms, that I cannot help suspecting a malarial origin.

From GILLINGHAM; *Dr. H. Morrow.* In every fatal case of Diphtheria we had, there was bad water — in fact surface drainage had washed into the wells and springs from which the supply was drawn. Greater care is needed in this vicinity in regard to using spring water which may be contaminated.

We had no Small Pox in this neighborhood, and worse still, we had no vaccination. I have never seen any such thing as disease communicated by vaccine lymph, and have always regarded the stories to that effect as sensational and untrue.

From GRAND RAPIDS; *Dr. G. F. Witter.* Diphtheria has occurred in this vicinity a few times only. I believe that damp cellars and excessive soil saturation furnish conditions which favor both the quantity and malignancy of Diphtheria.

There are very few in this neighborhood who are not protected by vaccination. I believe that there are striking exceptions to the rule, but as a general thing one successful vaccination is protective to the individual for life; nevertheless, to insure safety in all cases, I advise re-vaccination whenever there is danger of an epidemic of Small Pox or when there has been exposure.

From GRANT. The chief causes of ill-health here are overwork, especially among the farmers, living over damp cellars, insufficient variety in diet, and neglect to provide for sudden changes of temperature, particularly rapid declines, by corresponding changes of clothing.

From GRATIOT; *Dr. H. L. Stephens.* Measles prevailed in this town in an epidemic form from March to July, and nearly all who were susceptible were attacked, adults and children alike. Mumps were tolerably abundant at about the same time.

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Diphtheria had a history so peculiar that I must give it at some length. To the west and southwest of this village lies a plat of about a hundred acres, generally flooded by a dam on Wolf Creek and forming the Gratiot mill pond; late in June the dam was carried away leaving this ground, which in the course of years had become covered with mud, dry, and causing the death of many aquatic animals and plants; during July and August at certain times of the day, when the wind was in the right direction, the stench from this place pervaded the whole village. Nothing was done toward repairing the dam until late in August, when the mill was rented; although many citizens made application to the town board to have the nuisance abated the chairman of that body declared that it was needless and that the foul odors could have no influence on the public health. Diphtheria in very malignant form made its appearance in July and did not subside until September, on the 6th of which month the last death occurred. A family consisting of father, mother and seven children, living to the east of the village, was attacked with Diphtheria, which was not recognized until three had died and two others were beyond hope, the diagnosis having been "a mere cold following upon Measles," which was made by a practitioner who claims to have had large experience. August 8th the two cases referred to came into my charge; one died on the 14th, the other lingered on through various complications, which excited now hopes and now fears until September 4th, when she also died. On the 30th of August a sixth child was attacked, dying on the 6th of the next month, and on September 3d the last surviving child was seized, but happily recovered, though not until after removal from the house.

Now for the surroundings; on the east of this house was a bog-pasture of eight or ten acres in extent. A well is about twenty-five feet distant from the house, the water from which is clear, cold and has no objectionable taste,

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and the cellar is dry and well ventilated. The pasture was once a mill-pond and is at times muddy, but no bad odor arises from it according to my observation; aside from this I know of no cause for the extreme virulence of the disease; could the mud-bed have had anything to do with producing it? There were many points connected with the cases worthy of note, but they are rather of medical than sanitary interest.

From HAMMOND. One of our resident physicians says that the privies and wells here are so close together in many cases that they are in actual partnership.

From HARTFORD; *Dr. E. M. Rogers.* I am disposed to think one typical vacination protective for the rest of life, although for perfect safety I recommend re-vaccination whenever there is danger.

Diphtheria has prevailed in this village, but not to any great extent, during the past year; in most houses where the disease has appeared there have been unsanitary conditions, such as damp cellars and the like. Better sanitary regulations, more careful isolation of the sick, &c., are the causes of diminution.

From HEBRON. The reclaiming of marsh lands seems to have its effect upon the health of the community, and in changing the character of prevailing sickness although the change is not always immediately perceptible. Something in done every year hereabouts in the way of ditching and draining, and I must confess that I fear for the results while the transition from worthlessness to value is going on.

From HILBERT; *Dr. C. Mahneke.* I have had but a few cases of Diphtheria, and not one proved fatal; I do believe that a cause of the disease is to be found in wet cellars, bad water and marshy lands; three years ago the malady was very prevalent and fatal; I think the reasons of its decline are to be found in the facts that people are trying more to have good water, to keep their houses cleaner and

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in better sanitary condition generally, and that proper medical attendance is more frequently called for as soon as the disease is recognized than was formerly the case.

From HILLSBOROUGH; *Dr. F. Pinch:*—Judging from my own observations in former years, for I have had no Diphtheria cases during the past year, I should say that a damp or swampy location was decidedly bad for a patient laboring under that disease; certainly the malady has always been more malignant in such situations.

Four cases of Typhoid which I attended in one family I attributed to their supply of drinking water, which was obtained from a sluggish "spring" flowing from a low spot only a few rods from a rising ground on which stood the house, stable, barn-yard and privy, and which "spring" must have received the drainage from all! I could accomplish little in the way of improvement; all I could do was to secure the cleaning of the "spring" itself from the accumulation of offensive material actually in and around it. The common people of our state ought to be better educated in regard to matters pertaining to their health especially; whenever they are, we may look to find fewer instances such as that above described.

I had one case of Small Pox which presented the following noteworthy circumstances: The patient had been exposed about ten days before the disease was known to be in this vicinity, but none of the primary symptoms were manifest when he was vaccinated. In due time a vesicle appeared on the arm which seemed quite typical; just then the Small Pox symptoms became evident, and with their appearance the inflamation in the arm subsided wholly and the vesicle dried up. The man had regular Variola, but I have no doubt that had vaccination been performed earlier, he would either have escaped entirely or with the lighter form of Varioloid.

From HUSTISFORD; *Dr. J. Panetti:*—The chief source of

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danger to health hereabout is stagnant water on marshes and around dwellings; this with excremental saturation of the soil and unventilated cellars constitutes a standing menace. We have had no Diphtheria.

From JANESVILLE; *Drs. E. E. Loomis and J. B. Whiting.* There have been a few isolated cases of Diphtheria during the year, but much less malignant in character than usual, and at no time threatening to become epidemic. Wet cellars, impure water with neglect of thorough and perfect ventilation under the ground floors of many houses, and the presence of thick, heavy foliage in close promimity to the walls are fruitful causes of Diphtheria. The improved sanitary condition of our city in some respects, and the steady high water mark of our river, which has kept a large tract of land wholly overflowed that usually is covered in the Spring, remains dry during hot weather and is flooded again in the Fall, have been the chief causes of the decline of the disease in question. (E. E. L.)

The great danger that threatens our people is the saturation of the soil from privy vaults, many of which have been in use for more than thirty years, and have been made receptacles not only for personal excreta but for household waste as well — made into general cess-pools in fact until the earth is saturated to a disgusting and alarming extent. Our city is well situated for surface drainage and every considerable shower washes off all superficial filth into the river the rapid current of which carries it quickly away. But these horrible holes in the ground become more disgusting and dangerous with every year, and unless a remedy is found, Janesville, which has stood pre-eminent for the smallness of its death rate, will be compelled to surrender its place at the head of the list. I hope that I shall live to see the time when the law will make it a crime, to have one of the abominable nuisances within the limits of an incorporated city or village. (J. B. W.)

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From JEFFERSON: *Dr. I. J. Bennett.* I have had a number of cases of Diphtheria, especially during wet weather. Decaying log-houses, and drainage of filthy water into sources from which the supplies for drinking are drawn, have been very frequent accompaniments of the disease. I believe that wet cellars and saturated soil favor not only the malignancy but the spread of Diphtheria in all its forms.

From JUDA: *Dr. J. N. Clemmer.* I have treated over thirty cases of Diphtheria within the last year, and the conditions especially referred to in your circular, or some of them, have been present in a majority of instances. I am strongly of opinion that wet cellars and the proximity of marshy land have much to do with the causation of the disease.

From JUNEAU: *Dr. W. E. Hallock.* Diphtheria has, I think, been a little milder in type during the past year than heretofore. I hardly know what to say in reply to your question as to conditions; I had four cases in one house where large quantities of frozen potatoes were boiled down to feed to stock.

From KAUKAUNA: *Dr. O. G. Lord.* I was called in to see a little fellow of about six years old, whom I found suffering from Small Pox, not in a severe form, but still typical. He was one of a family consisting of father, mother and five children, all of whom, with the exception of the last, had been vaccinated, the parents in Ireland, the children about eight years ago. The mother told me that the oldest son had "had some sort of sickness" about a fortnight previously and that the other children had all been unwell, some of them suffering from nausea, and all being feverish; at the time I was called in all but the one mentioned were quite well, and no precaution had been taken to prevent them from contracting the disease further than keeping them out of the room in which the patient lay. I saw that this was useless, and told them so; and from that time on they were all in and out of the room freely, and not one contracted the

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disorder. I had vaccinated the little fellow about four weeks prior to the outbreak of the disease with bovine virus, but the operation was not successful.

From KENOSHA; *Dr. W. H. Saunders.* Bad water in surface wells has been a more frequent attendant on cases of Diphtheria, than any other single condition that I know of. Four children out of six died in one family whose residence was in an undrained section, where water stood in the cellars for three months. These were the most malignant cases that have occurred here.

The constantly extending use of Artesian well water is I think, an important factor in the improved health of our city, and I wish, through the State Board of Health as an appropriate medium, to make a suggestion for the benefit of those who may desire hereafter to sink these wells, especially in the southern part of this state. A sufficient number has now been drilled to show that the water obtained from the St. Peter's sandstone, is the same in character over the whole region above named, and northern Illinois; it is very heavily charged with carbonic acid which corrodes with great rapidity the iron pipes in which the water is distributed; thus the water soon carries so large an amount of iron in solution as to render it nauseous in taste and useless for many domestic purposes. The purity of the water in its normal condition recommends it as the best, obtainable in quantity sufficient for many towns and villages; to preserve this purity is eminently desirable and I wish to bring to the knowledge of those contemplating the use of Artesian well water, the experience already had therewith, to the end that errors heretofore made may be avoided and a pure and palatable water secured for domestic use.

Iron being the only available material for water mains must continue to be used, but its inner surface should be protected by a heavy coating of some material not liable to attack, as tin, or probably better, some of the so-called por-

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celain or granite coatings; the service pipe should be of lead, tin-lined.

By making use of such precautions this excellent water may be employed with safety and satisfaction wherever it can be obtained.

[Dr. Saunders has pointed out a danger attendant on the use of Artesian well water, such as is largely used in this state, and has also shown the remedy. Carbonate of Iron which would be formed in the pipes is soluble in water containing an excess of free Carbonic Acid gas, and is indeed the form in which Iron is present in most chalybeate springs; nearly all the iron is deposited merely by allowing such water to stand until the free acid has escaped, and the whole of it may be precipitated by boiling. It is better, as Dr. Saunders has pointed out, to avoid the necessity for doing this by properly lining the pipes in the first instance, but the propriety of lining lead pipes with tin is questioned.]

From KEWASKUM; *Dr. J. Schroendener.* A very severe type of Diphtheria prevailed in a neighboring town in December, '81, and January, '82. At first nearly every patient died, but the malady seemed to lose its intensity after awhile, and the last cases were comparatively mild.

I cannot say that any unsanitary conditions existed in the houses where the disease occurred that were not present in other houses which were exempt from its attacks. The worst cases, however, were within a region where we always have a good crop of Typhoid. In one family which I attended the father first had Typhoid Fever, then three children had Diphtheria, then the smaller ones had Catarrhal Pneumonia. After this, the mother had Typhoid Fever and died in four weeks from hemorrhage and the exhaustion consequent thereon. Then the three children who at first had had Diphtheria, came down with Typhoid Fever, and those who had previously escaped Diphtheria came down therewith. What I desire to call attention to is the

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intermingling of Typhoid and Diphtheria in the same family. This house was kept in as cleanly a condition as it is usual to find in farm-houses, and the well was distant from the privy one hundred feet, and from the barn yard two hundred feet. They said that the well water had been bad during the preceding summer; no specially unsanitary condition existed in or near the house.

[It seems highly probable that the use of the well water was the cause of the large amount of sickness above described. Nothing is said about the distance of the well from the *house*, or the way in which the waste water and slops of the household were disposed of, or of the character of the soil between the privy and the well. The water may have been contaminated by specific Typhoid poison, for all that appears to the contrary, and that it was so contaminated from some source or other, is, to say the least, very probable.]

From KILBOURNE CITY; *Dr. G. W. Jenkins.* Probably seventy-five per cent. of our people are protected by vaccination. All the cases of Small Pox that I have ever seen, originated in those who have never been vaccinated. I recall one case of Varioloid that was caused by burning the clothing, bedding, carpets, etc., used by a Small Pox patient; the poison was carried clear across a garden and an alley into an open window in an upper story where the man took the disease. Diphtheria has been very limited in extent and mild in type; I believe that wet cellars have a marked effect upon the malignancy of the disease.

Some two years ago I attended a case of Scarlet Fever in a family of seven children, all of whom, with one exception, had had the disease; this one took it at Grand Rapids and died soon after reaching this place. Eighteen months later another child was born, and was dressed in clothing that had been worn by the child who had died a year and a half before, which clothing had been put away in a trunk which

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had remained unopened since the time of the death; the second child took Scarlatina soon after beginning to wear the clothes described, there being no other case of the disease or source of contagion to which I could trace it. The case ended favorably.

From KILDARE; *W. B. Bulkley.* I can safely say that all the residents in this neighborhood have been vaccinated. I have generally preferred to use humanized virus, taking care to obtain it from healthy children, *i. e.*, those known to me to be healthy; I have never known any bad results to follow, excepting in one case in which Erysipelatous inflammation was excited when the vaccine pustule was fully matured; this, however, was in a scrofulous subject. There has been no Diphtheria here during the last year; this disease has no doubt prevailed very largely near water courses, and on low and marshy ground; of this I am quite positive.

There is too little care exercised by people generally in the disposition of garbage and excrementitious matters generally. The dwellings are none too clean, and when filth is deposited in the immediate vicinity, as is often the case, to impregnate the air and be breathed in by the residents, the sick of disease is greatly augmented. There should be greater vigilance in regard to these matters, and inasmuch as what is every one's business is no one's business, there should be a health officer in every town, who should be held responsible for its cleanliness. Of course he should be paid a reasonable compensation for his services, and in case of neglect to appoint such an officer by the town, the state should do so.

From LA CROSSE *Dr. K. Hoegh.* It is quite impossible to say what proportion of the people here are unvaccinated. The Poles and Bohemians, and a certain part of the Germans also, prefer to take their chances of Small Pox without vaccination, and their imported irregulars and a part of

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their press throw all their influence against it. I have used Bovine virus very largely, but prefer the humanized, and always use it whenever I can obtain permission so to do; I believe it to be more certain as well as more moderate in its action, and that it oftener produces the true Jennerian vesicle.

I do not think that the conditions named in your circular of inquiry have any influence upon the production of Diphtheria, or affect its character at all. I consider it as a purely infectious disease, the *materies morbi* being reproduced in the bodies of the sick and reaching thence to other victims through various channels. I have seen it on all kinds of soils. I have even been able to trace its transportation from one family to another by healthy carriers, sometimes in clothing; a case is known to me where the poison must have remained quiescent about a house for more than a year, and another in which it remained inactive for six months.

We have here in La Crosse every fall, and on during the winter, many cases of Typhoid Fever. The disease runs through a given cycle, usually making its appearance in August, becoming more prevalent during the following months, and dying out in the winter, so that if a few straggling cases are found in the spring they may always be brought into direct causal relations with cases that have occurred earlier. Many practitioners fail to recognize its true character, but I have always found the characteristic exanthemata. The cause must be, I think, a specific poison which seems to have the property of remaining latent in the soil; new villages seem particularly obnoxious to its attacks, but I believe that it is always the result of the poison produced by some preceding case.

From LAKE MILLS; *Dr. F. H. Dodge.* There has been no case of genuine Diphtheria here for several years. I have no doubt that wet cellars, decaying vegetable matter under

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dwellings and the like, have a bad influence on the malignancy of the disease.

From LINDEN; *Dr. B. M. Gill.* Probably not more than one-half of the residents hereabouts are properly protected by vaccination at this time. I favor the use of carefully selected humanized virus. Diphtheria has been mild in its type except in a single instance, where three persons in one household died. I believe that the practice of throwing house slops of all kinds out at the back door of dwellings is a fruitful cause of the development of the poison germs, especially in winter. One cause of the decrease of Diphtheria is the greater care in communicating with patients suffering from it. Too much cannot be said in regard to the proper ventilation of bed-rooms, particularly in warm weather.

From MARINETTE; *Dr. J. J. Sherman.* There is much in this town that is unsanitary and that I believe might aggravate Diphtheria should the disease break out; under proper conditions it might even originate the disorder; during the last year there has not been one case of genuine Diphtheria in my practice.

Last year we had much Typho-Malarial fever with no means of properly caring for patients without homes, but now we have a good hospital capable of taking charge of from twenty-five to thirty patients; it is called a private enterprise but our town and prominent business corporations have made such arrangements, as will insure prompt and efficient care for all.

From MARKESAN; *Dr. I. Manley.* There has been no *constant* unsanitary condition that I am aware of in the cases of Diphtheria that have come under my care. I have just treated a mild case, however, in a house where five persons have died from the disease at different times in three distinct families: this house stands in a low situation and the cellar is very damp. In another location I have had six

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cases in one house, one fatal and all severe; the original case was brought from Fond du Lac; the grand-father refused to have the patient isolated until five others had come down. There has been a marked decrease in the number of cases with which I think isolation has had very much to do. I think that there is a very marked improvement in sanitary conditions, much more care is taken in preventing filth accumulations, foul cess-pools, privies, etc., more attention paid to the condition of wells and cisterns, and I attribute very much of the improvement to the work of the State Board of Health. The publications of that Board are the standard authority among our citizens, and have been of the greatest service in stimulating Town Boards to active exertion and in every effort at isolating contagious disease, as also in instructing the people how to take care of themselves and their sick friends.

From MAUSTON; *Drs. J. I. Herrick and H. J. Stalker.* There seems to be some cause existing which tends to produce Diphtheria very generally; when treated in good season and among good surroundings it is usually mild; otherwise violent. In almost every case that has come to my knowledge, however, there has been some unsanitary condition present, as uncleanliness, imperfect ventilation, etc., etc. (J. I. H.)

Diphtheria, as I have seen it, has increased and has been more malignant in type. Excessive soil saturation last autumn and wet cellars have undoubtedly had some influence in its causation and on its character. Dysentery is at present prevailing to some extent among children, and, in some cases that were just recovering from Diphtheria, I was led, from the character of the discharges, to conclude that it was only one manifestation of the last mentioned disease. (H. J. S.)

From MENASHA; *Dr. L. Grasmuck.* In August and September last a form of Remittant Fever was very prevalent

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here; I prescribed for about sixty cases, and there were many others in the care of other physicians. Nearly all occurred in the city and very few, if any, in the country, showing that the cause must have been a local one. In four or five of my patients only did it assume anything like a Typhoid form, and one-third were "walking cases," never confined to bed at all. There were two or three deaths.

Of the cases of Small Pox reported elsewhere, eight were vaccinated after exposure, and six had good vaccine pustules, but all took the disease in some form or other; the other two were quite small children and vaccination failed with them entirely; both had unmodified Variola, and one died. The reason of failure was doubtless that the operation was not well performed, the parents resisting and even resorting to violence for its prevention.

From MENOMONEE; *Dr. W. F. Nichols.* I have observed that all cases of Diphtheria in my practice have occurred either in old log-houses, in houses standing on low, damp ground, or where large quantities of decaying sawdust are found.

From MILWAUKEE; *Drs. R. Martin and H. P. Wenzel.* During the first eight months of 1881 there were 234 cases of Diphtheria in this city; during the first eight months of 1882 there were 155 cases, and the disease does not appear to have been so malignant. Sanitation has been the cause of its diminution; our streets and alleys, lots and cess-pools are kept in a better condition and are cleaner. (R. M.)

Many scars that I have examined, supposed to be vaccine scars, have proven not to be such; they have been produced by worthless vaccinations and are simply blemishes which apparently satisfy their wearers, but are no signs of protection against Small Pox. A single successful vaccination in childhood is, I believe, protective until adolescence, at which time re-vaccination should be performed. After-

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ward re-vaccination by way of precaution when Small Pox threatens can do no harm.

Wet cellars, made land, saturated soils, filthy privies, foul surroundings, sewer gas, putrid sinks and foul back yards all have a tendency to increase the virulence of Diphtheria, but whether by stimulating the malady or by depressing the patient's strength, I am not able to decide. Greater atmospheric purity, better precautions against infection, or contagion, growing fear of the disorder, and absence of any epidemic influence are the causes of its decrease.

If in this city the tanneries, lumber-yards, mills and manufacturing establishments generally were restrained from making common sewers of the water courses, or if the water courses were kept clean and sweet by frequent flushing, and if proper persons were appointed, regardless of politics, to see that these things were done and so paid that they should devote their whole time to sanitation, we might look for great improvement in the health of our citizens, and, though a Sanitary Millennium might not immediately follow, a long stride would have been made in that direction.

"It is hard to teach old dogs new tricks," but our schools might begin teaching the children what it is to be clean, in the first place, and how to attain cleanliness in the second; pamphlets on the same subject addressed to the general public might also do much good. (H. P. W.)

From MONDOVI; *Dr. C. Hebard.* Diphtheria has been of a much milder type than heretofore; during the past year I have had no fatal cases. While I cannot say that there has been any constant unsanitary feature present in even a majority of cases, I believe that saturation of the soil and wet cellars can induce the disease.

From MONROE; *Dr. J. C. Hall.* If by the expression, typical results, in your questions, be meant a considerable febrile reaction in addition to strongly marked local effects,

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thus giving evidence of pronounced constitutional disturbance, I answer that a single vaccination, thus successful, is protection for life. My aim is always to produce such effects, and when they are not secured, I advise re-vaccination once in each four or five years. I have used Bovine virus for some years past, but I still am of opinion that the humanized form, *if not over-cultivated* by too many, removes from its original source, is safer from bad or poisonous effects, is more certain to work, and insures protection more promptly.

In regard to Diphtheria, the number of cases has been very small during the past year as compared with the two years preceding, but I think that its character has been unchanged. I cannot say positively that there has been any one constant unsanitary condition, because in the better class of houses and families in which the disease has prevailed, I find it so difficult to make the necessary thorough investigation required to form a correct judgment; especially is this true in regard to personal cleanliness, an important, though neglected point. The fact that the disorder has decreased, is due, not so much to any sanitary improvement, I think, as to the fact that nearly all the children in this city and vicinage have had it, and our experience here shows that one attack protects against further invasion. This immunity is not absolute or universal, unless mistakes in diagnosis are made; but I am inclined to distrust the reports sometimes made of patients who have Diphtheria two or three times a year; recurrent cases do occur, but I think they are rare.

I will add that in regard to sanitary conditions the *malignancy* of Diphtheria has, on the whole, held a strict ratio to the dirt, filth, dampness, and other contaminations surrounding those afflicted. The facts attendant on its history here, tend strongly to confirm the germ theory of its origin. The situation of this place, as well as its surface conformation, is favorable to health; but there is a total neglect of drainage, of privy vaults and their proximity to wells, and

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of the accumulations of filth, garbage, etc., in alleys, which neutralizes to a great extent our natural advantages.

P. S. I have seen one of our physicians to whom I read the above; he endorses it except as to the recurrence of Diphtheria, of which he thinks that one invasion renders the individual *more* liable than less to a second attack, and that the disease may recur in the same person over and over again.

From NECEDAH; *Dr. F. A. Canfield.* I am disposed to believe that one thorough vaccination is protective for the rest of life; I was vaccinated forty years ago and have never been able to make it take since upon myself, and although I have often been exposed I have always escaped Small Pox.

I think that damp weather with occasional showers of rain falling on the decaying saw-dust in our streets produces an atmosphere that greatly aggravates Diphtheria.

We are having a few cases of this disease of malignant type which I attribute principally to the character of the water supply which is drawn from sloughs and streams into which saw-dust, bark and slabs from the mills found their way for years.

Twenty miles north of us Small Pox appeared but was confined to a single family, in which, however, five cases out of seven proved fatal. A noteworthy circumstance connected with these cases, was the death of a gentleman who had the disease years ago and was well marked by it. Supposing that he was safe from attacks he offered his services as nurse; nevertheless he was seized after two days exposure and died.

From NEENAH; *Dr. J. R. Barnett.* There is no definite time during which vaccination may be said to be protective in all cases; re-vaccination is frequently successful where the primary operation has failed — that is, susceptibility to the action of the vaccine virus has either returned or been

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developed and with it the liability to contract Small Pox. I use bovine virus on account of its greater safety and certainty of action, but I have known of instances where humanized virus has been successfully used after the bovine has repeatedly failed. I have seen rashes follow upon vaccination of both kinds of virus, having some of the characteristics of the Varioloid rash, but I have never seen specific disease, *e.g.*, Syphilis or any other so produced. During the last winter a special Board of Health was appointed in this city, of which physicians were members, and every one in the place was vaccinated, voluntarily or compulsarily: there were no cases of Small Pox here.

I renew the suggestion made several years ago, that all rags used in paper mills should be thoroughly disinfected before assortment, that such disinfection should be made compulsory and the means legally prescribed; also that the operatives in paper mills should be subject to frequent vaccination, for example, annually, after examination by a competent physician. [An excellent suggestion.]

From NEW LISBON; *Dr. E. H. Townsend.* There has been more Diphtheria within a circuit of ten miles from this place, especially among Norwegians and Germans, than for three years preceding. Low places under bluffs, and in the vicinity of wet, marshy lands, dirt and over-crowding increase the mortality very greatly; although there has been little of the malignant form, the death rate has been seventy-five per cent. With isolation of patients, better water, less dirt, and more perfect drainage, at least one-half of the deaths from Diphtheria in this neighborhood might have been prevented.

From NEW RICHMOND; *Dr. O. N. Murdock.* In the village proper, Diphtheria has invaded only a single family, and there it originated by contagion; in the section tributary to the village, there have been thirty-four cases and eighteen deaths, showing quite a malignant type of the disease. In

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two instances certainly it could be attributed to local unsanitary conditions, but its increase generally is due to the ignorance and heedlessness of the Irish portion of the residents which leads to reckless and unnecessary exposure. Even though they have confidence in their physician they will not admit that the disease is contagious in many instances.

From OCONOMOWOC; *Dr. J. Regan.* I believe that a single successful vaccination is effective during life as a modifier of Small Pox virus, but I do not believe that it is effectual as an absolute preventive of the disease. I have not confined myself to the use of a single form of vaccine virus, although I prefer the humanized, provided the subject from whom it is obtained is free from constitutional taint; I think it more reliable, since there is much spurious bovine virus which, though it may give rise to a gangrenous postule, is worthless as a preventative or modifier of Variola, which might have abundant time for development while experimentation with such virus is going on.

Diphtheria has been rare during the year, and mild in type, yielding readily to treatment as a general rule; I believe that wet cellars and damp habitations especially, have a marked influence on the malignancy of the disease, and that a case of irritable sore throat may develope into Diphtheria if kept in such a habitation, while in a dry and warm atmosphere such cases will convalesce with no or very little difficulty. I have observed that when the wind blows from a northeasterly direction, especially in the spring, outbreaks of Diphtheria are very apt to follow.

From OMRO; *Dr. J. S. Daniells.* In this locality we vaccinated every body last winter, those who had never been vaccinated before and some who showed one or two good cicatrices; the virus worked well in a majority of all cases, better in many of the secondary than in the primary vaccinations. I advocate the use of bovine virus exclusively,

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believing it to be free from all risk of communicating or developing dormant disease.

We have had considerable Diphtheria in this vicinity, quite a good many cases occurring within the last two months. It has been of malignant type, many cases proving fatal. I cannot say that unsanitary conditions have always been present, though I think that such conditions may determine an outbreak and cause the spread of the disease, at the same time increasing its malignity. Certainly, when sanitary conditions are good, our patients' chances are much better, and they improve more rapidly.

A case illustrating one manner in which the disease may be spread, occurred under my own immediate observation not very long since, in a family numbering ten individuals, a father, mother and eight children. The first case, a child, died without treatment after an illness of sixty hours; I was called in to determine the cause of death, which I pronounced to be Diphtheria, and advised the funeral be strictly private and that medical attendance should be called in case of further outbreak. Two other children were seized that night and others in rapid succession, until the father only was left well enough to do the household work and nursing. A neighbor with whom the family had frequent and familiar intercourse, had had friends visiting him who had just recovered from the disease, and from the visitors the infection came to the whole family as above described. A man lost his daughter at Manawa by Diphtheria last spring and came here without having changed or disinfected his clothing; his brother-in-law and three children took the disease from him and all died; he visited another family where there were two children both of whom were attacked and both died. I record these cases as showing the power of the contagion and the means whereby it is often transported.

From ORFORDVILLE; *Dr. J. I. Johnson.* There have been some thirty cases of Diphtheria in this vicinity during the

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year; in many instances the type has been mild, but where unsanitary influences have prevailed, the disease has been violent and intractable. I have always found the type and prevalence of Diphtheria to be modified by the sanitary influences.

From OSHKOSH; *Dr. G. M. Steele.* During the recent high-water period, the lower parts of our city were so flooded that cellars, privies, wells, stables, etc., were all united; a result has been that early in the season we have had a greatly increased amount of fevers, malarial in type. There has been very little Diphtheria in this vicinity for the past year, and it has been easily controlled as a general thing. I am not able to say that there has been any *constant* sanitary error in the condition of premises where the disease has prevailed, but there has generally been more or less of filth and frequently wet cellars or sewer gas coming into cellars through the drains.

From OSSEO; *Dr. A. L. Wooster.* I have used both forms of virus for vaccination, and if the humanized can be procured free from all unhealthy taint, I prefer it to the bovine. I have seen Erysipelas set in, to an alarming extent, after vaccination with bovine virus, in a subject of scrofulous constitution.

I think Diphtheria is worse where foul cellars exist, and that poor diet also has its effects,— meaning by poor diet an excess of fried pork, etc. Where the well and privy are far apart, and the well drainage is toward the privy and barnyard instead of the reverse; where bed-rooms are well-aired, and cellars frequently white-washed and thoroughly ventilated; where vegetables are seldom stored under the living rooms, and never allowed to decay there; where these and similar precautions are taken, Diphtheria seldom comes, and when it does it is in some one of the lighter forms, being very rarely malignant. Not every case that is called Diphtheria is really so, however.

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From PESHTIGO; *Dr. H. C. Sibree.* A very marked unsanitary condition prevailing here, is the proximity of privy-vaults and wells; the water in the wells moreover is generally derived from superficial sources.

I have had three instances in which after vaccination with bovine virus, a rash has made its appearance, attended with a good deal of itching, and characterized by many of the features of Roseola.

From PINE RIVER; *Dr. B. D. Jewell.* There has been no unusual amount of Diphtheria here, and only three cases have occurred that can be called malignant. I have observed that the disease is more common and more malignant on low, wet ground, and in the vicinity of marshes, than on high, dry lands.

From PORTAGE; *Dr. W. Meacher.* Diphtheria has prevailed to the extent of some two dozen cases, in some instances being quite malignant. I had five cases in one family, of the worst type, all proving fatal; the household consisted of father, mother and five children -- girls, the oldest about 14, the youngest 1 year old. The children were all attacked and all died within a week, the disease rapidly assuming the gangrenous form. The habitation was the dirtiest I have ever seen, 'which is a good deal to say, for I have seen many that were bad enough,' and the whole family lived in one room. Previous to this there had been no Diphtheria in the neighborhood; since then I have had another series of five cases in one family, three proving fatal. I have little doubt that it was hatched in the place described above; these cases showed once more, how powerfully contagious the disease is.

From POYNETTE; *Dr. L. A. Squires.* Diphtheria has prevailed quite extensively in some neighboring townships, and its type has been malignant. In some cases the disease originated in block or log-houses where the cellars were damp and the whole structure lacked ventilation; I believe

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that excessive soil saturation conduces to the development of the disorder. Diphtheria is now decreasing, one cause therefor being, I think, the efforts made to have the people improve their sanitary surroundings.

From PRAIRIE DU CHIEN; *Dr. E. Steiger.* If we are to judge from strictly typical vaccine cicatrices, I fear that comparatively few are protected from Small Pox; very many have marks, but in many cases they are such only as prove some local irritation and perhaps inflammation at a former time. I have used both forms of virus and have secured the best results, as a general thing, from the humanized.

Diphtheria has been somewhat rare in this vicinity, though I have seen cases of follicular Tonsillitis that has been called Diphtheria. All diseases with tendency toward tissue destruction, whether gangrenous or otherwise, are more or less unfavorably influenced by wet cellars and similar unsanitary surroundings.

From PRESCOTT; *Dr. A. Young.* I am of opinion, judging from my own case, that a single vaccination may be protective during the remainder of life, though I am far from saying that such is the rule. There are probably very few adults in whom vaccination will not take a second time during life, if this be ordinarily prolonged, and I therefore advise re-vaccination once in ten years, or thereabouts, in all cases.

I have always used humanized virus until the past winter with satisfactory results. In deference to the popular demand I then procured bovine virus, with which I was not at all satisfied — the result in every case was complete failure, or what I deem still worse. I must confess that I decidedly prefer the humanized form, believing it to be more certain to take, and equally protective in its action, with less risk of severe local inflammation. I have never seen any disease communicated by vaccination, and believe, with ordinary

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prudence in the selection of virus, that there is no risk whatever.

From PRINCETON; *Dr. M. T. Millard.* There has been little Diphtheria here, and that mild in type. Two cases I think were caused by water standing in the cellar; it was very offensive in odor when agitated or disturbed.

From REEDSBURG; *Dr. C. A. Rood.* There have been but few cases of Diphtheria here, and only four that I have seen of malignant character. In all these instances water was in the cellars, marshes surrounded the houses, and one family was drinking water obtained from the cellar.

From RETREAT; *Dr. S. A. Meller.* I have had a good deal of Diphtheria in my practice during the year, probably a hundred cases in all, some of which were malignant; in one family the water was bad and potatoes in large quantities were rotting in the cellar; very plainly, I think the disease was caused by existing conditions in this instance, but in others different causes were at work; in one a neglected cold developed into Diphtheria; in a second the clothing of children who died were worn by other children without previous disinfection; and in other cases I could see no special reason why one or two should contract the disease and the rest escape; my practice has been to give preventives whenever Diphtheria attacks one member of a family, and they may have had an effect.

From RICE LAKE; *Dr. M. Whinery.* My opinion is that one entirely successful vaccination is protective for life; my own case is one in point; I have never been revaccinated and have been very thoroughly exposed. I prefer the use of humanized virus, if carefully collected; results are better, the cicatrix is equally distinct and there is less destruction of tissue.

Diphtheria has prevailed at Rice Lake and in the neighboring villages during the larger part of the year. I think

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that in our locality soil saturation and imperfect drainage have had all to do with causing the disease among children.

From RICHLAND CENTRE; *Dr. A. W. Bickford.* Unwholesome drinking water, damp cellars, decaying vegetable matter are the most frequent causes of Diphtheria, and greatly increase its severity.

From ROYALTON; *Dr. M. Wood.* Most of the families who have suffered from Dipththeria in this vicinity have lived in localities surrounded by low, marshy lands, and mill ponds. I have noticed that Scarlet Fever and continued fevers prevail to a greater extent in these marshy situations and upon undrained land.

From ST. MARTINS; *Dr. T. C. Malone.* We have had but little Diphtheria and that little of mild type. I believe that wet cellars, especially in connection with decomposing vegetable matter, have a decided influence on the malignity of this disease, and may even at times originate it. During an epidemic of considerable severity, which was at its height about two years ago, the note, "cellar poorly drained," appeared in the majority of cases, and where the cellar odor was most perceptible, the disease was apt to be most severe. It is my opinion, from personal experience, that the practice of storing vegetables in damp cellars is a most reprehensible one from a sanitary point of view, under any circumstances.

From SAUK CITY; *Dr. A. F. Jones.* I have seen few cases of Diphtheria during the past year, whereas during the two years preceding I had constantly many in my charge. I have observed that the proximity of marshes, decaying vegetation, foul cellars, and in one instance of a slaughter house, has *always* seemed to increase the virulence of the disease.

From SAXVILLE; *Dr. H. C. Van Arsdale.* Diphtheria has been generally of mild type, but in some cases malignant, and most so over damp cellars, on low, wet lands, flanked by

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cultivated fields; in one such place I had three fatal cases in a family of four. I am of the opinion that if prophylactic medicines were more frequently used on the first appearance of the disease, and sanitary precautions duly taken, Diphtheria would cease to be the scourge that it now is.

From SEYMOUR; *Dr. B. F. Strong.* I believe that, while Diphtheria always originates from contagion, filthy surroundings, and especially cellars filled with decaying vegetables, have very much to do with its character and malignacy. I attribute the decline of the disease largely to the greater care taken in avoiding contagion.

From SHAWANO; *Dr. J. D. W. Heath.* Wet cellars and excessive soil-saturation have very unquestionably a bad influence in cases of Diphtheria. I think the decline of the disease due to two causes; first, the general sanitary condition of the state is better than it has been heretofore, and second, I think that one attack gives immunity from a second for a time at least, and as we have had so many cases within a few years, there is not so much material on which the disorder can lay hold.

I have seen an instance in which a child of two years old, on being vaccinated, had an eruption similar to the vaccine pustule, over the body, arms and face; bovine virus was employed. This can hardly be called a communication of any specific disease, however.

From SHEBOYGAN; *Dr. W. F. Tifft.* This city contains alleys between the streets running east and west, which are used as deposit grounds for all kinds of refuse matters; pig-pens and stables are also located thereon, and whenever a heavy rain falls, this material with the manure, etc., from the last mentioned institutions is floated off and deposited here and there about the streets, in many instances close to dwellings. As health officer, I have only power to examine all places and report upon their condition to the aldermen of the ward in which they are located, who have authority

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to order removal or cleansing — which authority they sometimes exercise and sometimes don't. Sheboygan is growing rapidly and everything in the shape of a house, no matter what its sanitary condition may be, is occupied often to overcrowding, in the case of the poorer classes. What can be done?

From SHEBOYGAN FALLS; *Dr. C. B. Cody.* Diphtheria and Typhoid have followed close upon high water in this vicinity. Excessive soil saturation must, by contaminating the wells and in other ways also, help to produce the specific disease.

In the villages probably two-thirds of the residents are vaccinated and in the country probably not more than one-third of the people are protected at all.

From SOLDIER'S GROVE; *Dr. J. Dinsdale.* During February, March and April, Cerebro-Spinal Meningitis was quite prevalent here, more than fifty per cent of the cases ending fatally. The disease was confined principally to families living on flat lands where the soil was a black loam, and was especially severe where the houses were small and cold, and the children had not abundant clothing.

From SUPERIOR; *Dr. E. T. Gauvreau.* A local Board of Health has been organized here from which good results are expected. There has been little sickness of any kind; a few cases of Scarlet Fever confined to two families, and a few of Typhoid have been all in the way of zymotics. Our chief sanitary defect is the lack of good drinking water; to this want many cases of fever are due, and it is one which can be easily remedied whenever the town authorities see fit to act.

From TWO RIVERS; *Dr. J. R. Currens.* Very rarely within this city does disease of any kind attain a very malignant type, while only two or three miles back in the country, Diphtheria and Scarlet Fever have both been very severe, in many cases ending fatally. The only theory on

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which I can account for our exemption is, that the location of the city on ground that extends far out into the lake gives us a purer air, and the rivers afford a more perfect natural drainage than that with which most localities are favored. Slaughter houses are located in the city, and fishermen throw their refuse into the rivers, so that one would naturally look for some disease to follow on such carelessness, but thus far we have escaped anything like an outbreak of zymotic disease. Diphtheria has made its appearance in one or two instances, always in houses having wet cellars; when the cellars were drained the disease disappeared, and hence the connection between the two things seems established.

From UNION CENTRE; *Dr. T. Gilluly.* I have found Diphtheria to show itself with most violence in damp places, surrounded by marsh and timber, and where buildings were so situated that there could be no ventilation to the cellars.

With regard to vaccination, I do not believe that more than one-half the population are protected at all. I think as a rule that a single successful vaccination is protective for life; that it is only under peculiar and exceptional circumstances that the disease is taken after vaccination. Many years ago, at Columbus, Ohio, an old man was employed as nurse in the pest-house who had had Small Pox when young. He was in the hospital for four years, during which time he occasionally slept in the room with the Small Pox patients, and was thoroughly and frequently exposed without a thought of danger. Nevertheless, a patient was finally admitted with Congestive Variola from whom this old nurse took the disease and died. Now, I think it is such exceptional cases as this, which give rise to the impression on the part of the public and the profession also, that vaccination will in time wear out.

I vaccinated a five year old girl with virus that had proved

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effective in every other instance, but in her case it failed to make any impression, although repeatedly tried. Two years later she was exposed to Small Pox, took the disease and died.

From VIROQUA; *Dr. W. A. Gott.* In my judgment, filthy houses, and I use the word in the broadest sense, tend to spread disease, and wet cellars and excessive soil saturation have a similar power.

I saw one case of Small Pox in consultation, in which, according to the patient's statement, exposure took place on shipboard, where there were a number of cases. The eruption began to show itself just two weeks after landing at Castle Garden (the patient, who had immediately left for the west), being taken down immediately after his arrival at his destination. As there was no Health Board, the citizens took matters into their own hands on discovering the nature of the disease, and after some fifteen or twenty had been exposed, and measures were taken to isolate the patient, the resident physician had no difficulty in persuading all to be vaccinated in the village, and the action taken was so successful that no other case occurred.

From WATERTOWN; *Dr. W. F. Whyte.* In the majority of cases of Diphtheria, the hygienic conditions have been unfavorable and the surroundings bad; dampness of location and wet cellars have always seemed to me to be predisposing causes.

From WAUPUN; *Dr. D. W. Moore.* The only fatal case of Diphtheria that I have had during the year was over a wet cellar, with barn-yard near and wood-shed filled with old rails that emitted a smell of rotting wood. Generally the type of the disease has been mild.

From WAUZEKA; *Dr. C. C. Halsted.* Measles and Whooping Cough came to us through contagion from an adjoining town; Scarlatina has been sporadic in its occurrence, and I am not able to trace it to any direct or incidental contagion.

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Typhoid, of which we have had twenty-eight cases, was due to impure drinking water and damp filthy cellars. No means have been taken to control the spread of disease in any way.

From WEST BEND; *Dr. D. W. Lynch.* Diphtheria has been more prevalent than usual in this vicinity, though it has been confined to low, marshy localities, excepting in a few cases. I have had but a single case of Small Pox which came into my hands in the later stages. Other cases developed from this, but they were not under my care. In regard to vaccination, I prefer the humanized form of virus, thinking it equally effective, and much less severe in its effects than the bovine. I do not believe that more than sixty per cent. of the people hereabouts have been properly vaccinated.

From WRIGHTSTOWN; *Dr. W. H. Earles.* I am inclined to believe that excessive soil saturation, wet cellars, etc., do exert an influence both as to prevalence and malignancy of Diphtheria. In my own cases, which have been few, some unsanitary condition has generally been present.

The following notes upon the epidemic of Diphtheria from which we have suffered during two years, may not be without value. The territory which has been chiefly affected has been a strip about four miles long, lying on both sides of the Fox river, and not exceeding two and a half miles wide in the widest part. The disease has been especially severe in this village where the first case appeared in June, 1880; from this time until August following, the cases that came under my observation were mild in type though quite numerous; two only proved fatal. During the months of August and September, the malady assumed its most malignant form, fully sixty per cent. ending in death. After September the type again became milder, until the spring of 1881, when the malignant character again developed and continued for about two months.

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Since May, 1881, severe cases have been somewhat rare; Paralysis was a very frequent sequel. I have records of upwards of two hundred cases treated by myself and other physicians, all upon the same limited territory, and the general history was the same in all.

It is difficult to trace any connection between the existence and severity of the disease and the condition of those affected, as it proved equally fatal among the well-nourished and well cared for patients and those in poorer circumstances and worse surroundings; treatment in many cases was useless while in others it served only to prolong life; not a few cases proved fatal within two days after the appearance of the membrane, but the death rate from this and from other diseases is undoubtedly increased by the unhealthy surroundings of our village, particularly by stagnant water, the odor from which is quite perceptible throughout the summer months and at times during the whole year.

EXTRACTS FROM REPORTS OF CLERKS OF LOCAL BOARDS OF HEALTH.

To the special correspondence of the Board, the following extracts from communications accompanying the formal reports of the clerks of Local Board, contain matter of general interest. In one or two instances, by the wish of the writer, the name of the locality is suppressed.

From ALABAMA. A family resident here spent some months in Minnesota where a child contracted Diphtheria; after his recovery they returned home and very soon afterward the child of a neighbor, a playmate of the little fellow first referred to, was taken sick and died. The nature of the disease was not known and there was a large attendance

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at the funeral; other cases of Diphtheria followed, although they could not be or were not in all instances traced to exposure, direct or indirect. I have given warning of danger many times, and have been laughed at by some for my childishness as they call it, and have given offense to others for what they call my officiousness, but many are getting their eyes opened to the contagiousness of the disease, and I hope that people generally will do so in the course of time. One source of the fatality is the insidiousness with which Diphtheria makes its approaches; people do not realize that their children are sick enough to need a doctor until it is too late to do any good; doctors, moreover, are not easily accessible at all times; the nearest to us is twenty miles away.

From ARCADIA. Typhoid Fever began here in a family who used water from a driven well which was only four feet distant from a privy vault. Seven patients had come down with the disease, when the doctor forbade further use of the water.

From BALDWIN. Our Board of Health has ordered that all privy vaults be filled up and that no more shall be dug within the limits of the village.

From BIG FLATS. Since last fall the higher lands as well as the marshes, have been completely surcharged with water, and I fear the development of Diphtheria and Malarial Fevers, the more especially, as the greater part of our population, of both sexes, are liable to overwork themselves during hay and harvest time, and expose themselves needlessly to vicissitudes of weather at all seasons. Such unnecessary exposure is a prolific cause of sickness among farmers and their families.

From BLANCHARDVILLE. There is great carelessness shown in visiting at houses where Diphtheria is either actually existing or has recently occurred, and in this way, more than in almost any other, the disease is spread. As showing the power and persistency of the contagion, the

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following instance is instructive: A family had seven children all of whom had Diphtheria, two dying therefrom. Shortly after these deaths a young girl made a visit to the family and remained over night; she came down with the disorder a few days afterwards, and within six months two other cases of the same kind occurred. Nearly a year afterward another girl stayed over night at this house and died of Diphtheria within a week. There was no Diphtheria in the town at the time, and no means was known by which these girls could have contracted the disease other than by passing the night in this infected house.

From BLOOM. Our people are taking greater interest in sanitary matters than they have ever done hitherto; there is much more attention paid, whether in building new dwellings or in renovating old ones, to matters of ventilation, etc. Much of this is due to the teaching and influence of our resident physician.

From BRANNAN. I have carefully examined the water supply of this town, or rather, or the more thickly settled portion of it, for it includes ten townships of wild land, and have found it very poor; I do not know of more than a half dozen wells that are even an approach to proper construction; the majority of them are mere holes in the ground with more or less of stagnant water at the bottom. The village stands on low ground, the mill-dam helps to keep the soil saturated, particularly in rainy weather, and many of our people, while not sick in bed, are yet far from being robust and healthy. More dependence is put on Cough Syrups, Pain Drops and Liniments, than on skillful medical advice and more money is spent for them than would pay liberally for the latter.

From BURTON. Diphtheria of a malignant type has prevailed here to some extent, caused, I have no doubt, by the effects of the back water from the river upon the bottom lands in the immediate vicinity of dwellings and also by

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filthy barn-yards and cellars. In two families there have been six cases, of which five have already proven fatal. Vaccination has been general, but not so general as it should have been. Two cases of Small Pox have occurred in neighboring towns, both imported from Iowa, but the disease has not spread in either place.

From BYRON. There has been much greater care exercised in the drainage of cellars within the last year, than ever before; many new drains were put in during the fall.

From CHELSEA. Our Board of Health has been looking after the mill-owners, during the past year, and they have been obliged to clean up the filth and accumulations of rubbish around their premises.

From CLEAR LAKE. A Board of Health has been organized in this place lately, and will find abundance of work to do. Cholera Infantum has been very prevalent and very fatal here during the summer, as has Diphtheria also. The lake here is a small one having no outlet, and many are of opinion that it causes much of the sickness; the Health Officer has begun to clear away manure heaps of which there are plenty, he being of opinion that they have a worse effect upon the public health than the lake.

From COLFAX. Diphtheria came in the majority of cases from causes that might easily have been avoided, notably from contact with the sick and neglect of proper hygienic measures, especially a lack of personal cleanliness. Much sickness was also due to the use of impure water for drinking purposes.

From EATON. There has been much sickness in this vicinity that might well have been avoided altogether by proper precautions. Scarlet Fever has been spread in not a few instances by the carelessness of nurses and other attendants on the sick, and by the neglect to properly disinfect houses and clothing.

From EAU GALLE. I should be glad to fill out your blanks

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in full as desired, but no reports are ever made to the clerk by physicians or any one else, and hence there are absolutely no data to go upon except such as are within the clerk's own personal knowledge. There is no resident physician and our Board has never given any attention to sanitary matters. One great lack here is, that many of the houses have no privy conveniences whatever, and many have no cellarage.

From FORT WINNEBAGO. Our people have paid greater attention of late to cellar drainage, to cleansing and disinfecting old privies and to the location of new ones; as they are beginning to recognize the connection between Diphtheria and fevers and filth and dampness. The effects are decidedly good.

From KENOSHA. Our Board of Audit or Common Council act as a Board of Health when occasion requires—that is when any contagious disease such as Small Pox appears in our midst. Our doctors make reports semi-occasionally, to the County Recorder who pigeon-holes them when made, until there is quite an accumulation, say for six months, and then writes them up. Under the circumstances such a report as you require is rather difficult to make.

From LEON. During the heavy rains that have fallen during a part of the year, a great many cellars were filled with water and remained wet for two or three consecutive months. This state of things has been a sort of blessing in disguise, for it has led to many improvements that would never have been made without it. Privies have been reconstructed, and in many cases moved away from the water supply; drains have been put in and many precautions taken to prevent a recurrence of the flooding.

Much more care is taken when a contagious disease breaks out in a family in regard to isolation; when such a case unfortunately occurs, the household now isolates itself as completely as possible, and the trouble is thus usually confined

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to the place where it originates. Illustrations of this have been tolerably frequent during the year; a young lady took Scarlet Fever in an adjoining town and when she was deemed convalescent, came home here; soon after her return her brothers and sisters came down with the same disease, but it was kept confined to the one house. The head of a family probably brought Whooping Cough to his children; only two households suffered from it, and they were near neighbors and very intimate. The chairman of our local board has been very persistent in his efforts to keep the streets and roads clear of anything that can cause sickness, as dead animals, stagnant pools, etc., etc.

From LESSOR. A portion of our foreign population are exceedingly filthy in their habits, using the banking beside the house as a substitute for a privy, and getting their drinking water from holes dug in some low spot which receives all the surface drainage for a distance around. From these and similar causes a large amount of Typhoid Fever is developed.

From LINCOLN. Old and decaying log houses, and the use of impure water for drinking purposes, have much to do with the causation of disease in this vicinity.

From LINDEN. Our local Board has acted to suppress several nuisances, and to have pig-pens, manure heaps, and other similar offences, that were much too near dwellings, removed, and to have foul barnyards cleansed and rendered less offensive.

I received your note accompanying the report returned for further and fuller information, which I give herewith to the best of my ability. We have no regular organized Board of Health, and when the blank first reached me I filled them out in some haste, not thinking, to tell the truth, that they amounted to anything or were likely to be of much value to any one. On more careful examination however, I see their importance and the necessity that exists

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for having them filled out with all possible care, and have accordingly, with the help of our resident physician, done the best I could with them, and return them with all the information I can obtain.

From LODI. I am satisfied that much ill health is produced and that many cases of sickness are aggravated by over study. Our young children — certainly in this village — go to school too much and too early, and there is not a year that passes that does not see some of them break down under the strain imposed upon them.

From LORRAINE. Measles has broken out here on two separate occasions and in two families; by prompt action and by careful isolation it was confined to the houses to which it was brought from elsewhere at both times, and we have been spared the too frequent experience of an epidemic which breaks up schools and causes a great deal of sickness and attendant expense.

From LYNN. Typhoid Fever was occasioned in this town by the use of foul water for drinking purposes. Small Pox was brought hither by a man from Montana, the nature of the disease not being suspected until others began to come down. A seven-year-old boy attended the public school while his uncle was sick in the house with Small Pox; many children had not been vaccinated and hence the consternation was great when the true character of the sickness became generally known; within a week there were very few unvaccinated persons to be found. Fortunately no evil results followed the exposure, and the house was quickly and thoroughly quarantined. It is frightful to think of what might have happened, however.

From MAPLE GROVE. Small Pox was brought hither from the neighboring village of Hilbert by some persons visiting that place; as soon as its presence was discovered, our town Board took vigorous steps to prevent its spread, closing all schools and churches and forbidding any public assemblies;

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many persons were very indignant and claimed that the Board had gone beyond its powers, but neither pains nor expense was spared and the disease was soon stamped out. We believe that we kept entirely within the law, which does not define the powers of a Health Board very strictly.

We have some ground for thinking that there is a local cause of Diphtheria here, as most of the cases occur near a large marsh where water always stands, and others near a creek which is very much blocked with decaying rubbish. The Board made an effort not long since to drain the marsh, which could be done for about five hundred dollars, but there was so much opposition that the plan was abandoned.

[The law is purposely indefinite in prescribing the powers of the Board of Health, inasmuch as it may be needful to act very promptly in order to prevent serious disease. All the action above described and much more was clearly and fully within the powers granted by the statute, which authorizes a local board to do any act which, in its judgment may be necessary for the public safety.]

From MATTSON. Our local board has made a good many stringent regulations concerning health matters of late, ordaining, among other things, that no dead body shall be taken into a school house for funeral services unless a certificate signed by two physicians shall first be obtained that the disease which caused death was non-contagious, such certificate to be filed with the town clerk; that no person in attendance as nurse, etc., upon anyone sick with contagious disease shall enter any public place without changing his or her clothing, and that no child who has within fifteen days been exposed to any contagious disease shall be allowed to enter the public schools.

These rules have worked hardship, and, in my opinion, are all wrong, as they put everyone at the mercy of two persons.

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[The correspondent writing the above gives as an illustration of his position an account too long for publication here, but which does not in our judgment make out a very strong case. The circumstances as he narrates them show only a disagreement between two physicians as to a diagnosis and that the members of a single family have been very wisely excluded from attendance on the public school because of this disagreement. The rules, of which the substance is given above, are eminently judicious, and such as should be enforced in every town in the land. The case cited is an extreme one, but even so, and admitting its hardship, it is far better that one or more individuals should be even permanently excluded from school privileges, than that a whole community should be exposed to the risk of a disease like Diphtheria. Simple Tonsillitis does not often kill, and the physician who made the diagnosis of Diphtheria was probably entirely correct therein.]

From MINERAL POINT. During the past year our Local Board of Health has held frequent meetings; its most important acts have been the removal of pigsties and similar nuisances, and the enforcement of cleanliness generally. It has also made an attempt to compel the removal of slaughter-houses from the stream running through the city, but in this it has been unsuccessful, petitions having been presented asking that these establishments may be permitted to remain where they are, because they have already been there forty years; the procrastination of the common council has also been an obstacle to this reform.

[Probably the common council could be moved to more rapid action by the application of such a stimulant as is provided for by section 1418 of the revised statutes, published in the last report of this Board, and the owners of the slaughter houses might be proceeded against under the same section.]

From MISHICOTT. There has been little disease here of contagious character during the year, but it has not

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been because of intelligent action on the part of either the local authorities or the majority of people looking toward that end. I believe that a principal cause of sickness is the lack of hygienic knowledge. Thus, for instance, I have seen children attending school and going sometimes a distance of two or three miles to do so, wearing clothing such as to suggest the idea that the parents must have had a very high opinion of the child's heat-producing powers, and this in cases where the plea of poverty cannot be urged. Again, those who plan and build our school houses have little or no idea of what proper ventilation means; hence, the buildings become saturated with the foul exhalations from the bodies and breath of their occupants, and in a very short time are mere breeders of disease. People need instruction, too, upon what constitutes cleanliness, both in regard to their habitations and their bodies, and if our schools should teach their pupils something about these matters, and enforce the teaching by the scrupulous cleanliness of the houses which they occupy and their surroundings, they would be doing a far better work than is now done in too many instances. As it is, for the want of knowledge the people perish.

[The last report of the State Superintendent contains a number of plans for school-houses of almost every grade, which are in most respects well planned from a sanitary point of view, the chief defect being the lack of sufficient floor space to each pupil, and even this defect is not found in all. If the plans thus freely given to the people are followed, as they should be, our school-houses will very soon cease to be "mere breeders of disease," and the reproach to our western civilization that too many of them are at the present time.]

From MOUNDVILLE. Some thirty years ago Fever and Ague was very prevalent in this section; during the spring the marshes were overflowed, becoming dry again as the summer advanced, so that one walking upon them was sur-

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rounded by a cloud of dust composed of fine vegetable matter, and when the wind blew strongly this dust was carried pretty much everywhere for people to breathe in. When the dam and lock at Montello were built, there was a great outcry, on the ground of the increased amount of Fever and Ague that would follow, and predictions were abundant that the place would shortly become uninhabitable; the dam was built however, and the predictions were falsified, for Fevers entirely disappeared. Agues vanished, and nothing came to take their place. The summer of '79 was a very dry season, and the marshes were dry again for the first time since the building of the dam; at once the old trouble sprang up again in more malignant shape than ever before, and this continued until the heavy rains of last year covered the lands with water, when again Malarial Fevers were at an end. It seems to me pretty clear that Chills and Fever do not come from wet marshes, but from those that are alternately wet and dry through different seasons of the year.

From NEW DIGGINGS. Scarlet Fever broke out in our midst and carried off some victims, as usual, and caused much suffering and trouble wherever it made its appearance. There is little doubt that one cause of its malignancy was a privy, the vault of which was not over ten feet in depth, the drainage from which can hardly fail to reach the well of a family, said well lying on a hill below the privy, and not more that fifty feet distant from it. The privy belongs to the public school, and is allowed to remain in a vile condition of filthiness at almost all times.

From OTTER CREEK. Diphtheria here occurred in a family who drew their supply of drinking water from a marsh where the cattle ran and pastured at all times.

From PENSAUKEE. Some cases of Typhoid fever occurred at a boarding house in this town, the cause of which was the pollution of the well water by slops thrown upon the ground close by the well. There were no deaths.

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From PITTSVILLE. There have undoubtedly been cases of disease here that might have been avoided by the timely adoption of proper hygienic precautions. Measles and Whooping Cough, for example, have been spread through the town by the agency of the public school. Cleansing of cellars and more frequent cleansing and disinfection of privies would do much for the improvement of the general health.

From PLAINFIELD. A peculiar form of low, continued fever has been prevalent here, evidently traceable to decaying animal and vegetable refuse; it originated in an alley on which a butcher's establishment was kept that was carelessly conducted, and usually selected for attack members of families who were not very particular about the disposition of household filth.

From PLEASANT PRAIRIE. The past season has been an unusually wet one, and has had the good effect of moving people very generally to drain their cellars more thoroughly than ever before.

From PORTER'S MILLS. The Board of Health in this town exists in name only. It never meets and I venture to say that none of its members know that they are members of a Board of Health. There are no records, and making a report under such circumstances is a matter of difficulty.

From PRAIRIE DU SAC. The chief sanitary work done by our local Board of Health has been to abate a nuisance caused by yarding hogs in large numbers close to dwelling houses in the village.

From RIB FALLS. Measles was brought into this town by a farmer's daughter who had been working in a family living at Wausau, in which family the disease was then prevalent. The girl in question came home on a visit, went around among her friends and acquaintances, and attended a dance. The day after the ball she came down with

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Measles, and soon afterward many of the young people where she had visited, and those who were at the dance, also came down with the disorder, which did not finally disappear until the end of the winter. Some fifty persons in all, ranging from six to eighteen years old, were attacked.

From RIDGEWAY. Diphtheria prevails very extensively here among the Irish, the causes being, in my opinion, lack of care in keeping the houses, and especially the cellars properly clean, and carelessness in coming into contact with the disease. One family, who several years ago lost several children by Diphtheria, have during the winter lost four more by the same disease. To the best of my knowledge they had not been exposed to the contagion, and I am disposed to think that the malady originated in the house where they lived. Other cases however were clearly the result of contagion, a person coming here from a neighboring state who had lost five children by the disease.

From RIPON. Diphtheria here can be traced directly to the use of impure drinking water; the well used by the family in which the cases occurred being located by a pond of stagnant water which must leach through the soil into the wells in its vicinity.

From ROCKLAND. Notwithstanding that neighboring towns have been sorely afflicted with Small Pox, we have been wholly free from it, and our exemption is due to the fact that, as soon as it was reported that the disease was in our vicinity, vaccination was generally and promptly resorted to, and was repeated until it took effect, in some cases as many as five times.

From RUSK. Small Pox was without doubt introduced here by means of infected clothing sent hither from Canada. It was confined to two families, but there were ten cases. Typhoid was caused, in one instance, at least, by stagnant water around the house and in the cellar.

From ST. LAWRENCE. We have had Small Pox here and

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the cost to the town has been from $3000 to $5000, not reckoning the amount spent by the sufferers and their families.

From SPARTA. The health of the town is at present good; the natural drainage, however, is all that we have to depend upon, and the record of the place for healthfulness is due much more to natural causes than to any effort made by its inhabitants.

From SPRING GREEN. The school-house is the cause of more sickness in this place than any other one thing. The report made by a clerk of the school board in answer to the question, "Is the school house well ventilated?" was, "Yes, by broken windows;" and the same condition of things still exists. The needless and dangerous draughts thus caused, the fact that the temperature of the building cannot be satisfactorilly regulated, and the furniture being of antediluvian date, the benches being such that no child can sit upon them for any length of time without discomfort, all combine to produce the effect above alluded to.

From STURGEON BAY. Our town board has done a certain amount of sanitary work during the year, the most important being to prohibit the deposit of dead carcasses and other refuse upon the streets or in the Bay.

From WEST SWEDEN. Diphtheria was prevalent to a very considerable extent during the year, until the Local Board closed the public school and engaged a physician to take charge of all cases that occurred. The citizens also wisely abstained from all public meetings and general gatherings so far as was practicable, and thus by common co-operation, the disease, which at one time threatened to be very severe, was promptly and effectually controlled.

From WHITESTOWN. The chief sources of danger to health in this locality lie in the poor ventilation of very many of dwelling houses and the neglect to keep cellars properly

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the clean by removing decaying vegetables which have been allowed to accumulate through the winter.

From ———. [Permission was given to publish the following communication on condition that no names, either of person or place, should be printed.] Naturally our town is healthier than many adjoining it, as it occupies high ground, and has other advantages, but disease brings trouble and death to many a household that might well be saved but for the ignorance and carelessness of many of the people, and the perfect indifference of the sanitary officers and their failure to act.

Probably not one per cent. can be made to believe in the contagiousness of Diphtheria and accordingly mothers not only caress and kiss their little ones when that terrible disease has laid hold of them, but permit other children to do the same, and to receive the visits of sympathetic neighbors and friends, and thus the disease is kept alive and new centers of infection are constantly developed, whereas were proper care exercised and isolation enforced, we should soon see the last of the disease.

The same thing may be said of other contagious diseases. We have had Small Pox in three families; into two of these it was imported by men coming from the pineries, where they had come into contact with it, but in the third it was caused by pure recklessness, such as deserves the severest condemnation. A family came hither from the north having some cases of Small Pox, contracted as mentioned already, and when recovery had taken place they returned to the place from which they came. A resident here *purchased the provisions which they had left, and some furniture, and in spite of warning, removed what of his purchase he could to his own house, going to and fro between that and the infected dwelling without any precaution, and using the material without any previous disinfection.* The result was what might have been expected; every member of his family,

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eight in all, were stricken down by Small Pox of a virulent type, he himself being the first victim.

In many places in the town there are privies and manure heaps in close promixity to wells, with which they are in the freest possible communication. There was sufficient reason last year for the local Health Board to take all possible precautions for restraining the spread of contagious disease, but nothing whatever was done, for the reason that there is no law which compels action, and the members feared to lose popularity, and consequently re-election.

[The writer of the above has furnished name and address as guarantees of good faith, and communications from him have several times been received at this office and published in these reports; communications from other sources also confirm some of the statements above made, and it is certain that Small Pox was prevalent and severe in the vicinity; there is therefore reason for accepting the history given, astounding as it appears. There is a general provision in the Revised Statutes under which any officer who fails to perform the duties imposed upon him by law. may be brought to trial, and, if convicted, duly punished. Whether this provision would cover the failure of a Town Board to organize as a Board of Health in the presence of a dangerous contagious disease, and to take such precautions as are demanded under such circumstances, is doubtful. There is no doubt, however, that a local board failing to take action under such a condition of affairs as that above described, was guilty of a neglect of duty deserving of the severest reprehension. That a house in which Small Pox had occurred should be allowed to remain without prompt and thorough disinfection for a single day after being vacated is bad enough, but that the sale and removal therefrom of furniture and provisions should be tolerated or allowed is infinitely worse, and is evidence in itself of carelessness on the part of the authorities that is nothing less than criminal.]

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